FIRE DEPARTMENT ORGANIZATIONAL CULTURE: A BURNING NEED FOR CHANGE?

BY

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DISSERTATION

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Abstract

The number of firefighters killed in the line of duty has remained relatively unchanged for the past three decades, despite a decrease in the number of fires occurring, a decrease in the number of civilians trapped in fires, and improvements in technology related to firefighter personal protective equipment. The National Fallen Firefighters Foundation has asserted that the organizational culture that has developed among fire service organizations has contributed to many of these firefighter fatalities. An understanding of this culture and how it can be successfully changed can be used to develop safer practices to reduce the number of firefighters killed each year.

The purpose of this study is to build a comparison between two points in time for a fire company in the Midwest that experienced a Line of Duty Death and determine if and how that department's organizational culture changed between the two periods of time. Gagliardi's conceptual framework for the creation and change of organizational culture is used to analyze how the department changed as a result of the death.

A gap exists in the literature for studies that look at if and how fire departments change after an LODD, and sharing organizational culture changes made as a result of the LODD experience can be applied to other departments.

This instrumental case study of an Illinois fire department considers the history and traditions of the fire department, membership practices, initial and ongoing training practices, the routines present in the fire station, and the community into which the fire department responds. Two specific time periods were compared 2010 (when a new fire chief was promoted) and 2015 (4 years after the LODD) using Modes of Implementation

from Pasquale Gagliardi's model for the Creation and Change of Organizational Cultures. This model led to the identification of 28 areas of change grouped into seven broad categories.

Firefighters and officers of the department were interviewed via semi-structured format to provide information about components of the organization's culture before and since the Line of Duty Death. The study revealed that the leadership change that occurred in 2010 was a greater driving factor for change while the LODD served as a catalyst and motivator for change. The sustained changes resulted from the new leaders' vision, empowerment of his staff, and his influence on surrounding agencies.

Acknowledgements

To my wife, Laurie. You wavered less on my ability to complete this program than I did, helping me keep focused and motivated when I'd lost sight of the bigger picture. When I wanted to give up, you reminded me of why I'd started down this road and wouldn't allow me to quit.

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Lastly and overarching, to the Boy Scouts of America, for introducing me as a young man what how fulfilling a life spent in service to others can be.

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List of Acronyms

BLS	Bureau of Labor Statistics
CDC	Center for Disease Control
DQFD	Du Quoin Fire Department
EMR	Emergency Medical Responder
EMS	Emergency Medical Services
FD	Fire Department
FDIC	Fire Department Instructor's Conference
FDNY	Fire Department of New York
FEMA	Federal Emergency Management Agency
FF	Firefighter
HazMat	Hazardous Materials
HRD	Human Resource Development
IAFC	International Association of Fire Chiefs
IAFF	International Association of Firefighters
IC	Incident Commander
IFSI	University of Illinois Fire Service Institute (synonymous with SFA)
LODD	Line of Duty Death
MOI	Modes of Implementation
MABAS	Mutual Aid Box Alarm System
NFA	National Fire Academy
NFFF	National Fallen Firefighters Foundation
NFIRS	National Fire Incident Reporting System
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards & Technology
NSCCI	National Safety Culture Change Initiative
OSFM	Office of the State Fire Marshal
OSHA	Occupational Safety & Health Administration
POC	Paid On Call
PPE	Personal Protective Equipment
RIT	Rapid Intervention Team
SCBA	Self-Contained Breathing Apparatus
SFA	State Fire Academy (synonym for IFSI)
SOG	Standard Operating Guideline
SOP	Standard Operating Procedure
UL	Underwriter's Laboratory
USFA	United States Fire Administration

Preface

There are many influences in my early life that led me into a career in public safety. My father worked damage and fire control during his time in the US Navy in the late 1960s, and my two closest uncles were volunteer firefighters in my hometown of Saddle Brook. I remember watching the television show Emergency!, watching Steve McQueen lead the extinguishment of The Towering Inferno, building the same Lego fire station over and over again, playing with a Tonka ladder truck in my backyard, and dressing up in plastic children's firefighting gear. My grade school was named for an educator who perished in a house fire trying to save her grandchildren.

Boy Scouts reinforced the ethos of service to others that my family imprinted upon me, and led me to begin a career in the Fire and Emergency Services in 1990 with specific inspiration from my Scoutmaster, a Hackensack, NJ firefighter. The first Merit Badge I earned in Boy Scouts came from the father of one of the firefighters who died on my birthday in 1988 at a structural collapse and fire at the Hackensack Ford Dealership.

I have been both blessed to be a member of this Brotherhood and intrigued on how to apply concepts from adult education, organizational learning, and strategic change to the trade and profession of firefighting. This dissertation represents the pinnacle of the union between my two greatest opportunities to serve.

For this study, I went looking for a fire department that had suffered an LODD and emerged from that tragedy a better organization. Finding such a case was a greater challenge than I had expected. As the study progressed, I uncovered a department that was in the process of organizational change when an LODD occurred, serving as a catalyst for change as much as the driving force. I am humbled and impressed by the

men of the Du Quoin Fire Department, their commitment to becoming a better organization through deliberate change, and their leadership to learn from the death of Corey Shaw and prevent similar occurrences in the future. This research project was an inspirational journey for me and I hope that some portion of the positive changes made by the DQFD can reach a wider audience through this work.

"We understand the science of fighting fires, but we do not understand the science of people fighting fires" – A Montana "Hotshot" Wildland Firefighter (TriData, 1996).

Chapter 1: Changing Fire Department Organizational Culture

Since the time of Prometheus stealing fire from the gods of Mount Olympus, man has sought to harness fire. In our modern context, controlling and extinguishing hostile fire comes at a great cost to human life. While both the number of fires and the number of persons killed in fires has greatly decreased in recent decades, the number of firefighters that have died while engaged in firefighting duty has remained relatively unchanged (Clark, 2015). The National Fallen Firefighters Foundation (NFFF) links this persistent trend of firefighter death to the organizational culture of the fire service (NFFF, 2010).

The organizational culture of the fire service has been shown to have unique characteristics that are uncommon to non-uniformed professions. Dutch social scientist Joseph Soeters states that the peculiarities of organizations such as the fire service "justify the special attention of researchers to the culture and identity of these…organizations" (2000, p. 466). This fire service organizational culture is a contributing factor to many of the LODDs that occur each year (Temporado, 2012). According to Griffin, there has not been a scientific study of a fire department following a Line of Duty Death (LODD) before his research (2013). Like Griffin's research, this study was a case study of a fire department that experienced an LODD. This study differs because it analyzes the Modes of Implementation of the organizational culture of a

fire department before and after an LODD, drawing a comparison between the two time periods.

The work of firefighters is unique. While other professions seek to actively manage risks before engaging employees in a hazardous environment, the ad hoc nature of responding to fires in unknown buildings means that there is often less time to implement elaborate safety systems or to analyze hazards present because of the urgent nature of civilian rescue and the evolving and growing impact of fire attacking the structure (Kunadharaju, Smith, & DeJoy, 2011). Despite this dynamic environment and rapidly evolving set of risks, Kunadharaju's study identified root causes that could be better managed to lessen the potential for death and injury by analyzing reports on firefighter fatalities from the National Institute for Occupational Safety and Health (NIOSH).

This study utilized Pasquale Gagliardi's Model for the Creation and Change of Organizational Cultures to analyze one fire department in southern Illinois which experienced the fireground LODD of a member from the collapse of a burning building. The Modes of Implementation (observable traits of the department) were captured for two time periods, one before the LODD (2010) and one after the LODD (2015). The analysis determined that a change occurred, and used Gagliardi's model helps explain the change.

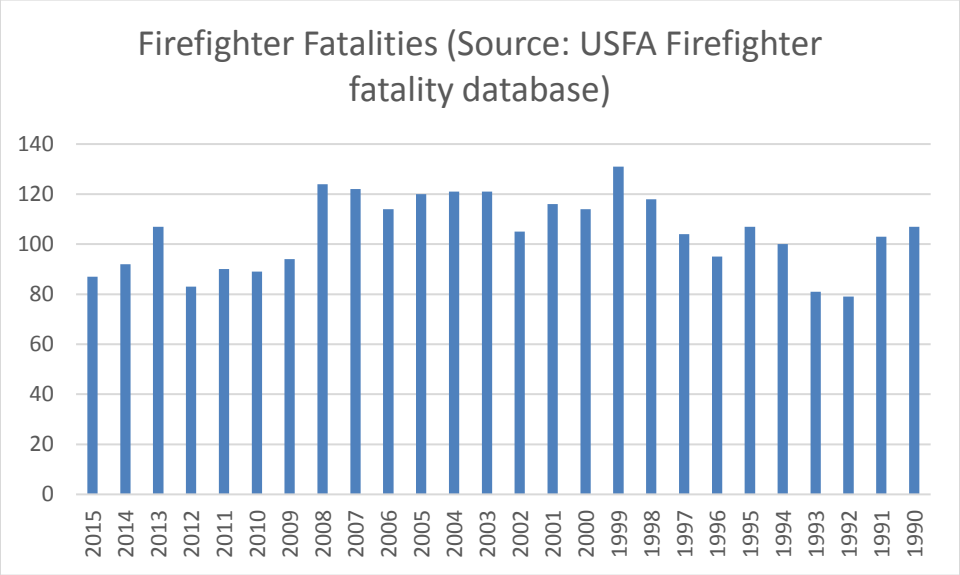
Background to the Study

The position of firefighter in the United States has its roots in colonial America where groups of volunteers protected the community in which they lived (Granito, 2003). It was common for these early volunteer groups to come together for community or

another benefit, with entire fire departments enlisting as military units in the Civil War (International Fire Service Training Association (IFSTA), 2010). Until the 1960s, the primary evolution of the fire service was from volunteer departments to career or paid fire departments in response to increases in population (Granito, 2003). Both the mission of the fire service, to save lives and protect property, and the level of safety and technology used to combat fires saw exponential growth from the 1960s to the present day (Granito). The mission expanded to include Emergency Medical Services, Hazardous Materials, Technical Rescue, and Terrorism responses. Technology expansion led to different firefighting gear configurations as well as the addition of thermal imaging cameras, portable radios, and computers into the fire service. At the same time, the number of fires in the United States decreased, the number of career firefighters has increased, and the number of medical calls that firefighters respond to as a part of their overall responses has expanded (Stromberg, 2015). The number of civilian fire deaths has also decreased.

Despite these new missions, improvements in technology, and reductions in the number of fires and number of civilian fire deaths, firefighters continue to die in the delivery of emergency services at an average rate of over 100 firefighters per year (United States Fire Administration (USFA), 2014; Pessemier, 2012). In 2005, the United States Fire Administration (USFA) set a goal of reducing these fatalities by 25% before 2010, and by 50% before 2015 (Compton, 2008). Chart 1 displays the information graphically. The responders killed at the World Trade Center in 2001 were excluded from the data set.

Figure 1.1: Graph of Firefighter Fatalities 1990-2015



Smith and DeJoy encapsulate the problem in this way: "Firefighting is dangerous work, but even acknowledging this, the rates of LODD and injuries suffered by U.S. firefighters are considered excessive and should not be accepted as a normal part of the job" (2014, p. 49).

At the same time the USFA announced a goal of a 25% reduction in deaths, the NFFF identified that a change in the organizational culture of the fire service was necessary to cause this reduction in fatalities. Additionally, the group indicated that a change in organizational culture also undergirded the other 15 initiatives they suggested (NFFF, 2010). The initiatives (abridged) from the National Fallen Firefighters Foundation (2010) are:

1. Define and advocate the need for cultural change
2. Enhance accountability for health and safety
3. Improve risk management
4. Stop unsafe practices
5. National standards for training, qualifications, and certification
6. Medical and physical fitness standards

7. National research agenda
8. Leverage technology for health and safety
9. Thoroughly investigate all fatalities and injuries
10. Implement safety through grant programs
11. National standards for emergency response
12. National protocols for response to violent incidents
13. Access to counseling and psychological support
14. Additional resources for public education
15. Advocate for home fire sprinklers
16. Safety as a design element for apparatus and equipment

This listing makes cultural change the priority, and also acknowledges that cultural change undergirds the other 15 initiatives. However the definition of culture was not provided, and no instruction or guidance on cultural change was provided. This lack of direction and definition was an inspiration for this study.

There is a unique organizational culture within the American fire service (Archer, 1999; Soeters, 2000; Daniels, 2005a; Thompson & Bono, 1993; Simpson, 1996) which consists of patterned ways of thinking (Kluckhorn, 1951/1967; Hofstede, 2001). Groups learn these ways of thinking during problem-solving, and then share solutions throughout the organization (Schein, 2004). Clark connects the organizational culture of firefighting back to Schein by equating fire department culture to "Why we do what we do" (Clark, 2015). This organizational culture can be changed.

The more deeply rooted the organizational culture is, the greater the challenge of changing the organizational culture because a primary function of the organization's culture is to maintain the culture in its current state (Gagliardi, 1986). Change of culture requires a change to how the organization responds to problems and stimuli. Since culture develops over an extended period of problem-solving experience as a group, this type of change is more difficult to make and more difficult to sustain. Culture is

developed from values, leadership, the leader's vision, successful outcomes resulting from the vision, and the values from the vision becoming a tacit part of the organization (1986). Success reinforces these values, entrenching them in the organization's culture. Each fire that the department extinguishes, each emergency response that ends successfully, each training that adds knowledge all strengthen the connections to the current way of doing things.

Statement of the Problem

The number of firefighters killed in the line of duty has remained relatively unchanged for the past three decades, despite a decrease in the number of fires occurring, a decrease in the number of civilians trapped in fires, and improvements in technology related to firefighter personal protective equipment (Smith, 2010; Granito, 2008; Pessemier, 2012). The National Fallen Firefighters Foundation has asserted that the organizational culture that has developed among fire-service organizations has contributed to many of these firefighter fatalities. An understanding of this organizational culture can be used to develop safer practices to reduce the number of firefighters killed each year. This study examined one such example of organizational change within a fire department that suffered an LODD.

Purpose of the study

The purpose of this study was to build a description of a fire company in the Midwest that experienced a Line of Duty Death and to determine if the department's organizational culture changed as a result of the death. A gap exists in the literature for studies that look at how fire departments change as a result of an LODD, and sharing

organizational culture changes made as a result of the LODD experience can be applied to other departments (Griffin, 2013).

Conceptual Framework

Gagliardi (1986) created a conceptual framework for the creation and change of organizational cultures. His model is well-suited for use in a study within the fire service because of the deeply-rooted culture that exists within a fire department. Cultures are stronger and more deeply-rooted where there is stability of membership, shared history and experience, and a lower number of subgroups with differing sets of experiences (Baker-Thompson, 2006). Stronger cultures also result when turnover is low, and technology is rudimentary or slow to change (Schein, 2004; Martin, 2002).

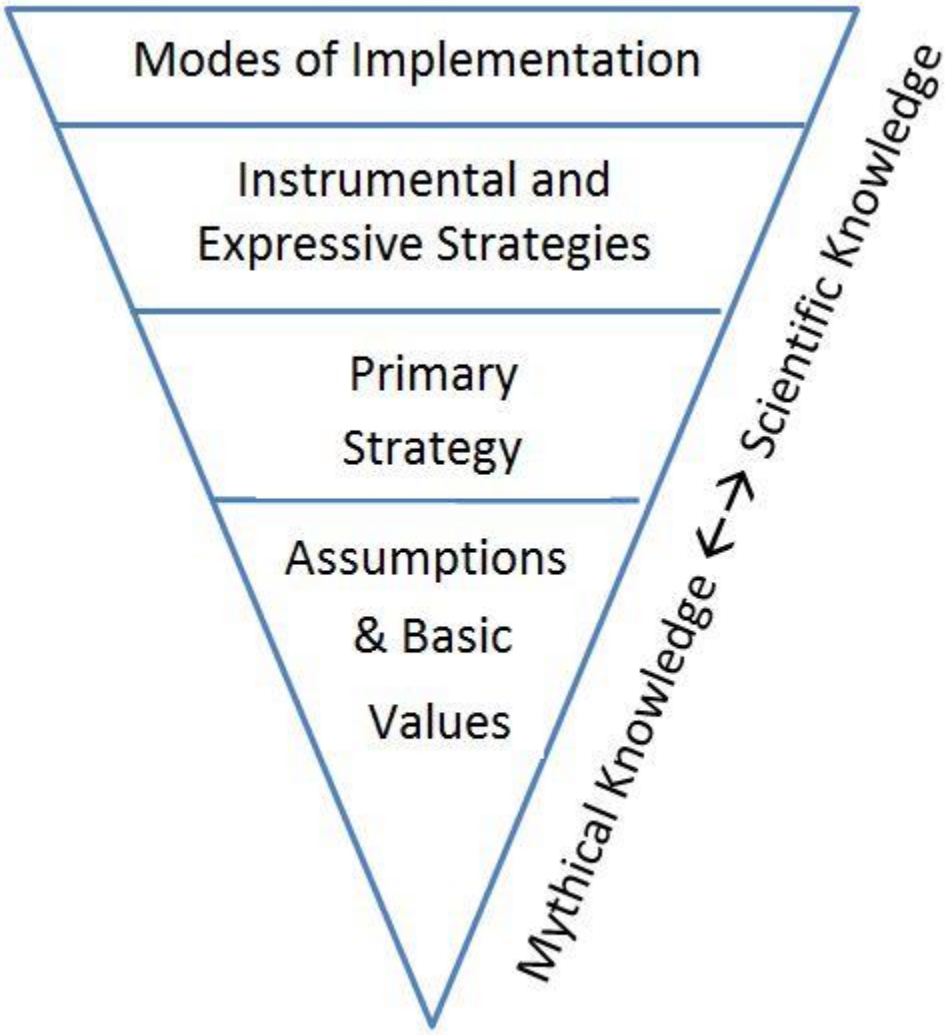
The more scientific aspects of culture are the Modes of Implementation, observable aspects of the organizational culture. The next layer is secondary strategies, then the organization's primary strategy, and at the core the values and assumptions of the culture. This core is more rooted in mythical knowledge than scientific knowledge, and it would not be uncommon for members of the culture to not be familiar with why a certain practice or behavior exists.

Gagliardi proffers that there are more options for cultural change, and greater potential for change, with aspects of the organizational culture proportional to the distance from the model's core of basic values. His model is like an inverted pyramid, ranging from modes of implementation at the widest part of the pyramid, instrumental and expressive strategies at the second level down, primary strategy at the third level towards the base, and assumptions and basic values at the narrowest point of the inverted pyramid as seen in the below graphic. Assumptions and basic values are the most

difficult to change, the primary strategy is less difficult, the instrumental and expressive strategies are less difficult, and the modes of implementation are the least difficult of the four levels.

The model is depicted here:

Figure 1.2: Gagliardi's Model of Cultural Creation and Change



This study focused on the Modes of Implementation (MOI) on the top of the model. Modes of Implementation are the observable behaviors within the organization,

and would have the widest range of acceptable options for change and require the least energy for a change, since these practices have a stronger foundation in scientific knowledge, and are more prone to direct observation and measurement. Fire suppression tasks, the step-wise performance of the work of the fire department, would be examples of such Modes of Implementation. Underwriters Laboratories (UL, 2014), the National Institute of Standards and Technology (NIST) (Madrzykowski, 2014), and the International Society of Fire Service Instructors (ISFSI) (2014) are three national groups or agencies conducting extensive research into aspects of fire behavior and suppression, but focused on the implementation of physical science studies into the fire service. Application of research from these groups is aimed at impacting the top two levels of Gagliardi's change model because scientifically-rooted practices can be rationally discussed and objectively changed more easily than the more mythically-rooted values and basic assumptions. This study focused on this outermost, most-scientific level for comparison of two time periods.

The next level of the model is the organization's instrumental and expressive strategies, also known as Secondary Strategies. These are the activities between the actual practices/work of firefighting and the maintenance of the organization's culture, which is the Primary Strategy. An example might be a fire department which wants to maintain its culture of fighting fires (Primary Strategy) might verbally support fire prevention activities such as inspections, pre-fire planning, and fire sprinkler ordinances, or might verbally express an interest in training or the provision of Emergency Medical Services (Modes of Implementation), but these activities are treated as a lower priority,

are not willingly completed, or are seen through the eyes of organization members as a distraction from the "real" work of fighting and suppressing fires.

Returning to Gagliardi's model, the third and increasingly harder aspect of organizational culture to change is the primary strategy. According to Gagliardi, the primary strategy of an organizational culture is to resist change. Additionally, the more deeply embedded the assumptions and core values (fourth and lowest level of the pyramid) are in the Primary Strategy, the more change-resistant the organization is likely to be. This resistance is because the assumptions and basic values are the very fabric of what the organization is and does. This area is most rooted in what Gagliardi classifies at mythical knowledge, with few if any explicit reasons for the creation of these values are evident (1986). In a fire department, these assumptions and values may date back to the foundation of the fire department, or ideologies held by the fire service since colonial times (Brunacini, 2008; IFSTA, 2010).

Gagliardi used this model to analyze how and to what extent an organizational culture can change, which is central to the research questions of this case study. A component of his model supported by Schein is that organizations have a primary mission of maintaining the extant organizational culture, the distance from the specific organizational culture can lend a perspective that those within the culture cannot gain awareness of due to this almost gravitational blindness afforded by the organizational values. In this way, an outsider could apply objective and scientific analysis to the situation surrounding an LODD better than an internal analysis team can because an internal team could have more difficulty separating the mythical knowledge that is ingrained in the organization's culture from more objective or scientific knowledge.

For success in making a change to the organization's culture, Gagliardi offers a concept he calls Cultural Incrementalism, where the basic values aren't changed, but the fan of options to change tactics within the current values and assumptions is expanded. This involves selecting additional values that aren't antagonistic to the existing ones, but different from them, and leveraging these expanded values to create new opportunities and solutions. He suggests adding value without removing an existing one as a way to augment the Primary Strategy, which in turn allows for greater options for the Secondary (Instrumental and Expressive) Strategies, and ultimately additional acceptable options for the delivery of firefighting services in a manner acceptable to the organization's culture. Because values are hierarchical and not independent of each other, this model allows for cultural change with organizational growth. Additionally, this model allows for the separation of Modes of Implementation from the Secondary and Primary Strategies, allowing the observable behaviors of the organization to be dissected from the rationale behind them.

This model is a good fit for this study because of the deeply-rooted culture of the fire service (Baker-Thompson, 2006; Schein, 2004; Martin, 2002). Additionally, Gagliardi's model stratifies culture from the most scientific to the most mythical, allowing the user to focus on changes at a specific level of the model while holding other aspects of the model constant or reserving them for future studies. Lastly, Gagliardi's model is built around the premise of incremental change- changing in small ways by modifying existing behaviors, which is more effective in strong cultures (1986).

Research Questions

Three research questions guided this study:

RQ 1: What were the Modes of Implementation of the organizational culture of the fire department in 2010?

RQ 2: What were the Modes of Implementation of the organizational culture of the fire department in 2015?

RQ 3: Did the organizational culture of the department change from 2010 to 2015?

Significance of the Study

This case study provided insight into how one department underwent a cultural change between 2010 and 2015. During that period, the department had a leadership change and also endured the tragedy of a member dying at a structure fire. Through an analysis of the organizational culture of the fire department and the change it experienced, a deeper understanding of this culture and LODDs can be developed. Understanding this relationship within the organizational culture of the fire department can aid departments in their understanding of cultural change and how to be successful at organizational change in general. This understanding is critical to change the culture as the National Fallen Firefighters Foundation desires. While there has been a great call for research into firefighting organizations, "very little systematic research has been completed" (Smith, 2010, p. 63), and there exists only "a limited understanding of (fire department) organizational culture" (Pessemier, 2012). Additionally, only one other scientific case study of a fire department LODD has been completed (Griffin, 2013).

Methods/Procedures/Rationale

A single instrumental case study (Stake, 1995) of an Illinois fire department was conducted. This case study considered the history of the fire department, membership practices, initial and ongoing training practices, the routines present in the fire station,

and the community into which the fire department responds. Firefighters and officers of the company were interviewed using a semi-structured format to provide information about components of the organization's culture before and since the LODD. In an instrumental case study, the case is of secondary interest to the study, and the study is driven by issues, contrasted to an intrinsic case study where the case itself drives the study (Stake, 2000).

The occurrence of change was identified by a comparison between the Modes of Implementation in two time periods- circa 2010 (before the leadership change and LODD) and 2015 (4 years post-LODD). Questions related to the LODD were limited and not initiated by the researcher.

Limitations

Qualitative studies, in general, are difficult to apply broadly to other organizations (Denison & Spreitzer, 1991). The results of this case study are not meant to be generalized, but rather to develop a deeper, richer understanding of the organizational culture that is in place within the selected case. While there may be some similarity or applicability to other cases, there must be scrutiny to ensure that the cases are sufficiently alike to extrapolate themes or categories from this case study to another.

Assumptions

There are several assumptions that grounded this study. First was the assumption that the organizational culture of a fire department is directly linked to the flat trend seen in LODDs. The second area of assumption is that the researcher's background in emergency response did not bias the interviews, and a third assumption is that the researcher gained sufficient access to the closed fire service culture to collect meaningful

data. Lastly, it was assumed that participants were as complete and honest as possible when participating in interviews, and portrayed as truthful a recollection as they were capable of contributing.

Organization of the Remainder of the Study

Chapter 2 of this study first places the study in the context of the HRD literature, considering the concepts of culture, culture change, and strategic organizational change. It then reviews the relevant literature from professional journals from within the fire service, as well as peer-reviewed journals, governmental reports, conference proceedings, books, and dissertations.

Chapter 3 contains a description of the design and methods used for data collection including how the case was selected using Illinois and national databases, the forms of data to be collected, how data were analyzed, and issues of validity and reliability. Because this case is centered on a sensitive issue, human subject protections were deeply considered and the plan for ensuring that interviews were as non-traumatic as possible is included. The tools utilized in the data collection phase as well as Institutional Review Board (IRB) approvals are listed in the appendices.

Chapter 4 provides the setting for the case study of the fire department. It opens with an overview of the community followed by a historical view of the fire department. Three episodes that were very influential in the development of the department's organizational culture are included to provide a deeper perspective on where the 2010 culture originated. Lastly, the story of the fatal fire that killed Corey Shaw of the DQFD is presented.

Chapter 5 shares the study's findings, grouped by the Modes of Implementations that arose from the case analysis. This comparison demonstrates that change did occur, and then uses Gagliardi's Model for the Creation and Change of Organizational Cultures as a framework to analyze the change.

Chapter 6 offers conclusions, implications for the study, and areas for further research to expand upon this study in other milieus, locations, types of departments, and sizes of departments.

Chapter 2: Literature Review

The purpose of this literature review is to provide background on the problem of firefighter fatalities and how the organizational culture of a fire department can be contributing to these Line of Duty Deaths (LODD). The review consists of two sections. In Section 1, an overview of the fire service in the United States and the problem of firefighter fatalities are reviewed. Section 2 contains information on culture in general, the culture within organizations, the culture within the fire service, and a model for changing organizational culture. The United States Fire Administration identifies the fire service culture as a significant contributor to line-of-duty deaths.

This project was guided by the following research questions:

RQ 1: What were the Modes of Implementation of the organizational culture of the fire department in 2010?

RQ 2: What were the Modes of Implementation of the organizational culture of the fire department in 2015?

RQ 3: Did the organizational culture of the department change from 2010 to 2015?

This project was situated in the center of three bases of knowledge. It exists within the literature on culture, organizational culture, and values; cultural change within uniformed organizations; and fire service organizational culture, firefighter fatalities, and the fire service's self-initiated call for cultural change.

The literature review was based on peer-reviewed journals, fire service trade magazines, conference proceedings, books, newsletters and position papers, reports from government agencies such as NIOSH, NIST, USFA, FEMA, and the BLS and

dissertations from both within and outside of the fire service. A meta-analysis was conducted of other case studies not related to this topic to help structure the paper.

This chapter is divided into two sections, the first focused on the history and impact of fires and firefighting in the United States, including the problem of firefighter fatalities. The second section defines culture and organizational culture, provides examples of culture within the fire service in the United States, cultural change, and describes Gagliardi's conceptual framework for cultural change.

Section 1: The Problem of Fires and Firefighter Fatalities

This section provides an overview of the history of firefighting in the United States, followed by an overview of firefighter fatalities that have occurred since the United States Fire Administration began keeping records at a national level in 1977. Next, the need for a cultural change to reduce the numbers of line-of-duty deaths were discussed.

A Brief History of the United States Fire Service

Fires in the early days as colonists settled the United States led to the establishment of fire departments as well as the creation of the nascent nation's first fire prevention and building codes (Granito, 2003). As early as 1608, a fire in the Jamestown settlement devastated the community. Fires in 1623 at Plymouth Plantation, in 1653 along the Boston waterfront, and in 1655 in New Amsterdam, as well as accounts of the 1666 Great Fire of London demonstrated the catastrophic effects of fire to the colonists (Granito, 2003).

Originally, all firefighters were volunteers, but over time, full-time fire departments were formed in larger metropolitan areas (Granito, 2003). Destructive fires

in colonial America illustrated the risk of fire to the community and led to the formation of firefighting clubs to protect the property and possessions of the citizens. These white male-dominated clubs were regarded by John Adams and Benjamin Franklin as producing colonial heroes in the early 1700s. There was a strong social side to these clubs, providing both services to the entire community and recreation for members. In Philadelphia, these clubs also played a role in economic activities, such as shareholding in private industry, and political activities, such as the recovery of runaway servants or apprentices. In New York and Boston, these exclusive groups were fraternal organizations, guarded with watchwords to aid in identifying members who were in need of the club's services. This exclusivity led to the establishment of early public fire departments to care for those who were not members, or who could not be members, of these established clubs (Carp, 2001).

As the number of clubs and public organizations grew, these groups shared lessons learned and tactics and strategies that led to successful fire control. Equipment imported from Amsterdam and other European communities often came with stories that shared the experiences of firefighters in other cities and nations. When the Revolutionary War broke out, firefighters were quick to volunteer for military service, and others were granted exemption from the military by serving the community as a firefighter. As the British Army occupied cities like Manhattan and Boston, they were left with decimated fire companies, or in the case of Boston, departments that had to be put under British Military control to ensure a timely response (Carp, 2001) These foundational days of U.S. fire departments still resonate with firefighters today, as "the original response routine that Ben (Franklin) established in 1740 has defined the cultural context … and set

the stage for how (the fire service) has operated for the next almost 300 years" (Brunacini, 2008, p. 4).

Some of the traditions exhibited in today's fire service were carried over from the US Civil War soldiers who transitioned into the fire service following their military career. The paramilitary nature of the fire department and the deep funerary rituals associated with LODDs have been traced back to these origins (Clark, 2015).

In 2014, there were an estimated 1.13 million firefighters, with 69% being volunteers and 31% having the fire service as their main career (NFPA, 2016). Granito shares that this is a normal shift that as cities and their suburbs grow and mature, full-time fire crews become a necessity.

During times of economic downturn in the United States, the position of firefighter was secured and envied (Granito, 2003). These firefighters were reluctant to risk their financial security by seeking increased safety measures or shorter work hours. Additionally, officers did not prioritize the health and well-being of their firefighters over the inherent dangers of the job. Until well after World War II, most fire departments provided only fire suppression services, with firefighters typically working 85 hours per week or more (Granito, 2003).

Since the late 1960s, the job of firefighter rapidly evolved from only providing fire protection to responding to a broader set of emergencies. These additional emergency missions include delivery of Emergency Medical Services (EMS) in the late 1970s, beginning in Chicago, Seattle, Los Angeles, Miami, and Columbus, Ohio (Granito, 2003).

Along with the expanding duties of firefighters, the work environment became more hostile. In the 1960s, firefighters and police officers became targets for riots, arson, and demonstrations resulting from civil unrest (Granito, 2003). This activity of human threats, along with the release of the landmark study America Burning in 1973, began an era of significant change in fire departments across the nation (Granito, 2003). Federal and labor agencies focused on increased firefighter safety as fire departments expanded the list of services the departments provided (Granito, 2003). Increased understanding of the damage that hazardous chemicals and materials can do the environment led to the addition of training to mitigate chemical emergencies in the 1980s (Noll, 2003). Eighty-five percent of fire departments now offer some level of Emergency Medical Services as part of their daily operations (Janing & Sachs, 2003). By 2002, 94% of fire departments offered some level of Emergency Medical Services as part of their daily operations (Michos, 2003).

This broadening of missions transformed "firemen" into "all-risk" or "all-hazards" emergency responders (IFSTA, 2010). However, fire-related emergencies continue to be the leading type of emergency that kills firefighters, accounting for 71.4% of fatalities (55 out of 77) in 2013 (USFA, 2014). A challenge for fire service leaders is to balance the contemporary threat of terrorism and the delivery of emergency medical services with other missions while remaining proficient in the delivery of fire suppression service (Weeks, 2007; NFPA, ND).

Modern fire departments in the United States are generally organized into one of three broad categories: Career fire departments, where all firefighters are paid by a city or other urban center; Volunteer fire departments, where all firefighters are not paid; and

Combination fire departments, which are a hybrid of some paid and some unpaid members (IFSTA, 2004). The fire department considered for this study is a combination department, with seven full-time members and 20 paid-on-call members.

Within a fire department, tasks at a fire or other emergency are typically assigned based on the functional capabilities of the fire apparatus that individuals respond on, or are grouped with after their arrival at a fire in their personal vehicles. The broad categories of apparatus are engines, trucks, and rescue/squad companies. Engines are primarily responsible for advancing hose lines to the seat of the fire and extinguishing the fire while truck companies force entry into the structure and perform other tasks on the fireground to aid the engine company to extinguish the fire. These tasks include creating openings on the vertical parts of a building and the roof to allow smoke to leave the structure, applying ladders to enter/exit a building, and controlling a building's electric, water, and gas utilities. Rescue companies typically focus on removing civilians and firefighters who are trapped (IFSTA, 2004). These roles are usually well-defined in fire departments with predictable manpower, and more ad hoc and fluid in departments which do not have a fully-paid fire department, as is the situation in the department studied in this case. This fluidity of roles and tasks involved in firefighting, especially in the volunteer and combination departments, can create a group who is well-intentioned but constrained by a lack of understanding of their organizational culture (Pessemier, 2012).

Patrons of United States fire departments view the role of the fire service differently than those in other nations. Outside of the U.S., fire departments tend to be centralized and national agencies, whereas the fire service in the U.S. is local, and more deeply connected to the population. Annually, the United States Fire Service has more

Line-of-duty Deaths than any European nation and has the fourth highest firefighter fatality rate in the world. The U.S. firefighter fatality rate is six times higher than any other industrialized nation, due in part to lower levels of regulatory control when compared to other U.S. industries (Pessemier, 2012).

According to the National Fire Protection Association, in 2013 (the most recent year that complete data is available), there were 1,140,750 firefighters in the United States, with 31% serving as career firefighters and 69% serving as volunteers (NFPA, 2015).

The Impact of Fire in the United States

In 1973, the National Commission on Fire Prevention and Control published the landmark study America Burning. This initial look at the fire problem in the United States revealed that 6,200 persons, including firefighters, died annually as a result of hostile fire (Burning, 1973). Additionally, over 100,000 injuries were reported annually, with a dollar loss of over $10 billion (in 1973 dollars) (Burning). The report estimated a nationwide rate of 300 fires per hour (p. 18), which translates to over 2.7 million fires annually. In 2007, there were 1.24 million fires in the United States, leading to 3,240 fire deaths, for a property loss of $11.5 billion dollars (Karter, 2014). This represents a 47.74% reduction in the number of civilian deaths from fire and a 54.07% reduction in the number of fires overall.

Firefighter Fatalities in the United States

There is an inherent risk with firefighting (Burning, 1973). According to America Burning, "Every fire is a gamble with the unknown, a venture into a unique complex of combustible materials and fire dynamics. Risk substitutes for certainty, intuition for firm

knowledge" (Burning, 1973, p. 2). In contrast to other occupations, which seek to avoid hazards, firefighting has a primary purpose of actively seeking out and engaging the hazards under extreme time pressure (Kunadharaju, Smith, & DeJoy, 2011). There are common recommendations to lower firefighter fatalities in the United States which are not new information to fire service leaders, but rather are unheeded advice that maintains an annual 100 firefighter death toll (Moore-Merrell, Zhou, McDonald, Fisher, & Moore, 2008).

Francis Brannigan was quoted by Dr. Burton Clark as having said: "We are not killing firemen in any new ways" (2015, p. 46). His meaning was that the recommendations of NIOSH reports and death investigations produce a familiar list of repeatedly unheeded recommendations, all with no power for implementation because NIOSH is a part of the CDC, which has no legal authority to sanction agencies for violations. Clark continues by sharing that firefighters do not die due to a "lack of rules, lack of knowledge of the rules, or lack of training on the rules, or lack of ability to follow the rules" (2015, p. 46). The rules for safety exist and are frequently identified as being broken on the path to an LODD.

According to Kunadharaju, industries outside of the fire service employ layered, redundant systems for employee protection, where firefighters tend to have little depth to protective measures such that a single failure point can quickly lead to a catastrophic situation leading to firefighter injury or death (2011). This diversity of single points of failure was reflected in the root-cause analysis. Lack of standardized procedures and practices, lack of incident command or management was present in one-half of trauma-related fatalities such as the fatality studied for this case. Training and communication

were also key factors, intertwined with the lack of policies and procedures for managing an emergency incident.

The routine work of firefighters includes unique hazards, including the risk of disorientation or entrapment while operating in an unfamiliar, burning, or unstable building, and physical stress and threats, all occurring within a hostile environment with a limited supply of breathing air. More specifically, 30% of structure fire related fatalities from the period 1998-2001 were as a result of a building collapse (excluding the events of 9/11/2001, where 341 firefighters and 2 fire marshals died as the result of a single incident), flashover or rapid fire progression resulted in the next 26% of structure fire LODDs, and 16% listed lost/disoriented and running out of air as the cause of death (Hodous, Pizatella, Braddee, & Castillo, 2004).

The top three recommendations for prevention in this same time period for these specific fatality types, based on NIOSH data compiled by Hodous et al., are to have standardized practices for fighting structure fires, have continuous communication between the outside of the structure and those operating on the interior, and to have crews ready to initiate the rescue of a trapped firefighter (2004). Additional recommendations deal with the use of safety equipment and safety officers, having sufficient persons and maintaining accountability of all persons operating at a fire scene, and developing a strategy based on the fire conditions and structural conditions through the lens of risk-versus-gain. Out of these eight areas identified as frequent recommendations for all reports in the 1998-2001 period studied by Hodous, all could be applied to the case being studied here, with six out of eight of the recommendations from Hodous being explicitly or implicitly mentioned in the NIOSH report (NIOSH, 2011).

The lack of ability for firefighters to assess and predict building collapse is a key factor which contributes to structural LODDs. In the absence of such a tool, improvement in these areas could be made by incorporating the common prevention recommendations listed in the Hodous study (2004), plus additional specific information on building collapse listed in the NIOSH report for this fatality (NIOSH, 2011).

Quantifying Firefighter LODDs

One of the results of America Burning which greatly informed this study was the creation of the United States Fire Administration (Burning, 1973). Since 1977, the United States Fire Administration (USFA) has tracked firefighter LODDs and reported an analysis back to the fire service (2014). In 2004, the agency partnered with USFA primary stakeholders and set a goal to reduce on-duty firefighter fatalities by 25% in 5 years, and 50% in 10 years (NFFF, 2010; Compton, 2008). An on-duty fatality is defined as any injury or illness sustained while on-duty that proves fatal (NFFF, 2004). Beginning in December of 2003, these statistics also include personnel that died within 24 hours of duty, because of the Hometown Heroes Act. This act called for the inclusion of firefighters that died within 24 hours of an emergency response. Before this act, the firefighter had to complain of or display symptoms before the termination of the emergency or shift to be included as an on-duty death (USFA, 2014).

For the period of 1977 through 1979, the average number of firefighter deaths per year was 151. For the 1980s, the average number of firefighter deaths per year was 127 and dropped to an average of 99 firefighter deaths per year in the 1990s. For the period 2000 through 2009, the annual average was 110 (USFA, 2014). This average excludes the 341 Fire Department of New York (FDNY) firefighters and 2 FDNY fire marshals

killed on September 11, 2001, at the World Trade Center. Excluding the Hometown Heroes Act, the annual fatality rate per year (average of fatalities for the period 2000-2009) for the same period is 102.1 per year (USFA, 2015).

Table 2.1: List of Firefighter Fatalities by Year, 1990-2015

Year	Firefighter Fatalities (Source: USFA Firefighter fatality database)
2015	87
2014	92
2013	107
2012	83
2011	90
2010	89
2009	94
2008	124
2007	122
2006	114
2005	120
2004	121
2003	121
2002	105
2001	116
2000	114
1999	131
1998	118
1997	104
1996	95
1995	107
1994	100
1993	81
1992	79
1991	103
1990	107

Smith found that the firefighter LODD rate is four times that of the general working populations, and 3.3 times that of workers across U.S. industries (2010). According to the U.S. Bureau of Labor Statistics (BLS), in 2013, there were 247 workplace fatalities in the protective service occupations, with a 194% increase in firefighter fatalities. Half of the increase attributed to two major LODD events in Texas and Arizona. In the same period, fatalities for law enforcement in the U.S. dropped 20 percent to a new low of 97 fatalities (BLS, 2014).

While the number of annual fatalities overall appears to be decreasing, it must be considered relative to the overall decrease in the occurrence of fires to which departments respond. Pessemier (2008a) calculated the number of firefighter deaths in terms of deaths per 100,000 fires. He found that in the period from 1995 to 2004, firefighter deaths per year increased from 4.94 deaths per 100,000 fires to 6.64 deaths, an increase of 34 percent. Daniels (2005a) agreed that the number of firefighter fatalities has at least remained unchanged in the preceding three decades. Dow, Garis, & Thomas have found that firefighter fatality numbers are increasing, and are reversing improvements made in the 1970s and 1980s (2013). Kunadharaju, Smith, and DeJoy agree that there is an upward trend in firefighter LODD in the period 2000-2010 (2011). Clark (2015) calculates firefighter deaths based on time at risk and found that firefighting is in a tie for the most deadly occupation with a ranking of 128. He also calculated firefighter fatalities in terms of the number of fires, using fires as a unit of work production. These calculations make firefighting 41 times more deadly than manufacturing, and 248 times more deadly than mining (Clark, 2015, p. 27). These increases suggest that the current

systems in place for reducing firefighter LODDs are at best insufficient, and support the need for additional changes to lower this increasingly fatal trend.

Daniels (2005a) asserted that until the fire service is willing to make substantial changes in training, procedures, equipment, and recruiting, this fatal trend shall continue. In some cases, the injurious behaviors may have originated as a bad habit that evolved slowly over time into a tradition, slowly injecting a poor practice or dangerous procedure into the fire department over generations (Gasaway, 2005). Firefighters may engage in an unsafe act, thinking it is the correct way to operate or behave because the unsafe act or technique was how they were originally instructed (Gasaway), or because participating in violating safety rules without pejorative consequences reinforces the wrong behavior (Clark, 2015).

In June of 2007, nine firefighters from Charleston, South Carolina, were killed in a fire in a sofa store. In the initial report on changes that needed to be accomplished in the department to prevent a reoccurrence of a similar tragedy, one of the highest priority items was a change to the department's culture (Routley et al., 2007). Griffin (2013) studied the changes to the Charleston Fire Department following this fatality. He identified that by studying the conditions leading up to an LODD, and the changes made within the organization as a result of the LODD, other fire departments can learn vicariously from these hard-won lessons. He agreed that there was no existing literature relating to organizational changes made due to LODDs in a fire department.

In addition to the number of fatalities, firefighting also has a higher injury rate than other nations with similar practices, as well as a higher rate than the U.S. Military. Peterson et al. identified over 95,000 injuries per year (2010), and Hodous et al.

supported this with a calculation of 90,000 injuries per year with an increasing rate of injury in the fire and emergency service (2004). Brennan (2011) extracted the number of on-emergency-scene injuries to be 32,205 in 2009 and compared this to the number of members of the US Military who were wounded in combat. In the period from October 2001 through August 2008, there were 30,568 U.S. service members wounded in action- less than the number of firefighters injured in the single year 2009 (Brennan, 2011).

The deadly nature of the U.S. fire and emergency service is not just severe when compared to the U.S. Military in wartime. In the decade 1990-1999, the United Kingdom (UK) had 33 line of duty deaths and less than 2500 injuries. In that same period, the U.S. had 83,000 injuries, with just fewer than 50,000 of those occurring on the fireground (Daniels, 2005b). In 2007, there were six firefighter fatalities in the UK, and in 2008 there were none. In the same period, there were 236 fatalities in the U.S. (Murphy, 2011). Even accounting for differences between populations, The fire and emergency service has a poor track record of safety and must look for more efficient methods of service delivery that come at a lower human cost (Bruni, 2012).

The Firefighter Life Safety Summit

The first Firefighter Life Safety Summit took place in March of 2004 brought together more than 200 fire service primary stakeholders to reduce firefighter on-duty deaths (NFFF, 2004). This summit produced a list of 16 Life Safety Initiatives considered "essential to keep firefighters from dying unnecessarily" (NFFF, 2004, p. 2). The first initiative listed is to "Define and advocate the need for a cultural change within the fire service relating to safety" (NFFF, 2004, p. 4). The participants unanimously agreed that this cultural change was the foundation of the other 15 initiatives, calling for a

fundamental change in how fire departments operate (NFFF, 2004). The 16 Life Safety Initiatives are:

1. Define and advocate the need for cultural change
2. Enhance accountability for health and safety
3. Improve risk management
4. Stop unsafe practices
5. National standards for training, qualifications, and certification
6. Medical and physical fitness standards
7. National research agenda
8. Leverage technology for health and safety
9. Thoroughly investigate all fatalities and injuries
10. Implement safety through grant programs
11. National standards for emergency response
12. National protocols for response to violent incidents
13. Access to counseling and psychological support
14. Additional resources for public education
15. Advocate for home fire sprinklers
16. Safety as a design element for apparatus and equipment

These initiatives were a sound and appropriate decision since most programs aimed at changing behavior fail if they do not take the underlying culture into account (Schein, 2000). Ashkanasy further advocated that to be successful, parts of the culture that have value should be enhanced or rewarded, while detrimental portions should be downplayed (2000). However, this requires an agreed definition of culture to anchor the discussion, and an agreed description of the specific areas of the culture that are in need of change (Schein, 2015).

At the center of this cultural change is the need for the fire service to cease accepting that 100 firefighters must die annually as a standard sacrifice or cost of responding to fires (NFFF, 2004). This group set the goal for a 25% reduction in fatalities by 2009, and a 50% reduction in fatalities by 2014.

To summarize Section 1, there has been a 44% reduction in the number of civilian deaths from fires from 1973 to the present. There has been a 40% reduction in the number of fires in the United States in the same period. While there has been a fluctuation in the number of firefighter on-duty fatalities in this time, and a change in the definition of what constitutes an on-duty fatality, the reduction in firefighter deaths has not kept pace with the reduction in civilian death and fire loss. The goal of a 25% reduction in five years and a 50% reduction in 10 years set by the USFA was not met. The organizational culture of the fire service has been connected to the failure to reduce firefighter line-of-duty deaths, but it has not been defined or described.

Section 2: Culture, Organizational Culture, and American Fire Service Culture.

The current culture of the fire service must be described before the fire service can change that culture. This section discusses the concept of culture in general, followed by a discussion of the construct of organizational culture, next narrowing to the literature dealing specifically with the organizational culture of the fire service.

Culture

Schein (2004) described the culture of a group as the "basic, shared assumptions" (p. 17) learned by a group as it solves its problems. He indicated that when this problem solving is successful, the methods are taught to new members as correct solutions to the problems (Schein). Hofstede (2001) refered to these assumptions as the "collective programming of the mind" (p. 1). Kluckhohn similarly defined culture as "patterned ways of thinking," based on traditional and historical ideas (1951, p. 86). Gagliardi is aligned with these three definitions, identifying culture as "a coherent system of

assumptions and basic values which distinguish one group from another and orient its choices" (1986, p. 119). All four of these definitions identify culture as a process that occurs in the individual, based upon learned behaviors that are influenced by the organization. Conceptual models from Schein (Figure 2.1) and Hofstede (Figure 2.2) are included here and Gagliardi's model (Figure 1.2) is found in chapter 1.

Figure 2.1: Schein's Three Levels of Culture (Schein, 2010, p. 24)

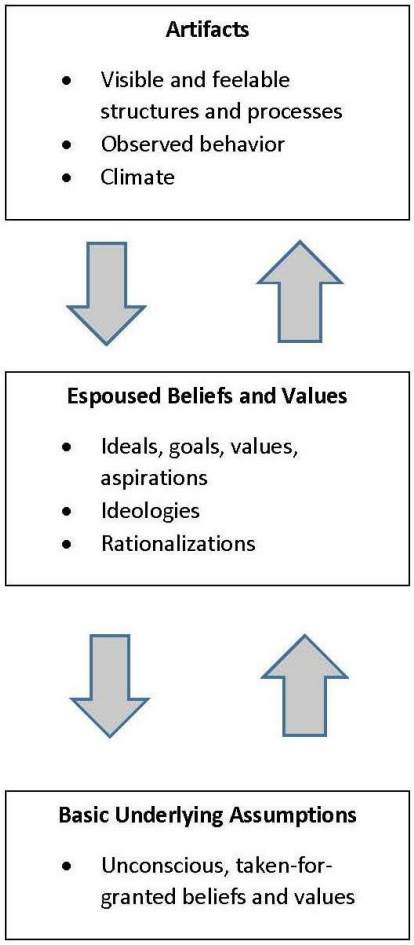
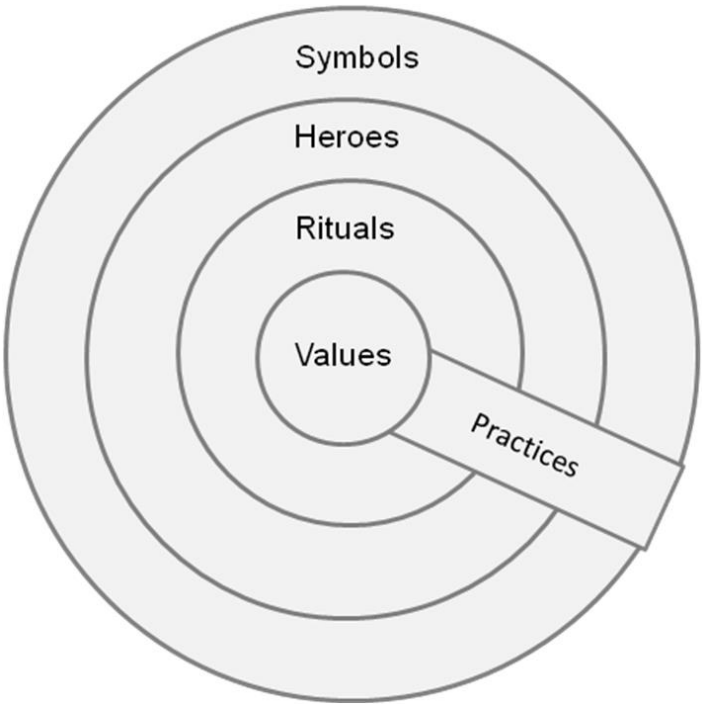


Figure 2.2: Hofstede's "Onion" Model



Duncan (1989) identified that culture itself is elusive and difficult to describe, and Cameron (2006) states that culture is often taken for granted. An organization's culture is reflected in the group's internal characteristics, its character, and its daily existence (Goodman, Zammuto, Gifford, 2001). Culture has a significant influence on the experiences of individuals that operate within it (Harris & Mossholder, 1996). Gagliardi uses the term organizational culture to refer to both the value system and assumptions that the group utilizes to frame decisions, and behavior models, beliefs, symbols, technologies, and artifacts (1986).

Culture in Organizations

Hofstede defined the construct of organizational culture as the "collective programming of the mind that distinguishes members of one organization from another"

(2001, p. 391). Schein identified that culture exists at macro levels (national, ethnic, religious, occupational), organizational level, occupational level within groups, and at a microsystemic level below this (2004). He described organizational culture as "the pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems of external adaptation and internal integration, and that have worked well enough to be considered valid, and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (1984, p. 3).

Culture reduces anxiety by helping members of an organization classify and interpret the stimuli external to their immediate environment (Schein, 2012). As culture in general differentiates different nations, culture of organizations differentiates different occupations. However, there is no universal or single culture that describes all fire departments, law enforcement organizations, or military units (Soeters, 2000).

Chatman & Jehn (1994) completed research that offers empirical support that firms in the same industry share cultural similarities. Uniformed professions, such as police departments, fire departments, and military units have such a unique culture unto themselves that these organizations possess characteristics, such as a sense of duty and allegiance, which are not found in such a strong degree in other professions. Gordon (1991) also supports this uniqueness of organizational culture and identifies it as a derivative of assumptions made about the customers of a given industry.

Fire Service Organizational Culture

Organizational cultures develop as subcultures as part of the normal evolutionary process in public sector organizations (Baker-Thompson, 2006). Uniformed

organizations represent "specific occupational cultures that are relatively isolated from society" (Soeters, 2000, p. 465). Archer (1999) triangulates this by his assertion that the fire service is "characterized by its strong culture" (p. 94) that includes the use of a uniform, hierarchical command structure, promotion solely from within the existing ranks, and long-standing traditions. Fire departments further differ from other organizations in that they are exposed to uncommon levels of danger, work unusual schedules, require a lot from their members, and can recall staff and cancel their leaves (Soeters, 2000).

Fire department, law enforcement, and military organizations have unique indoctrination procedures that inculcate their specific culture at special schools, acquainting members with the demands of the profession, as well as the special privileges that society affords to them (Soeters, 2000). Some of these practices date back centuries, as military groups were some of the first formal organizations. They are also characterized by a Janusian or two-sided organizational culture- one which has both emergency response/combat (hot) and non-emergency response/non-combat/administrative (cold) aspects and functions to the work (Hofstede, 2000).

Soeters identified three consistent aspects across police, fire and military group cultures as communal life, a hierarchical command structure, and strong discipline. The feature of communal life that builds a unique and deep organizational culture is the immersive nature of it- a strong overlap between work activities and leisure activities with the same group of people, and a feeling that the rules that govern work time may also extend to leisure time activities. The hierarchy of these organizations creates internal bureaucracies which rely on a rank structure to make decisions, which drives

decision-making frameworks within the organization. Lastly, discipline, or the strong compliance with rules, orders, and authority within the organizational culture, can govern actions as a member of the police or military culture. A difference between the military and police culture exists in the area of discipline since the police have a feedback mechanism from the public, where the military does not have a formal and consistent mechanism for such feedback (Soeters, 2000).

These three aspects of organizational culture are reinforced by Ford (2012). He identified traditions such as looking out for each other, working a particular shift, group rituals to begin the workday, company and department insignia and uniforms which all reinforce communalism. Hierarchy is reinforced through choosing/bidding on shift schedules, new members washing the dishes, seniority, and differing rank insignia and dress (Ford, 2012). Discipline has two distinct aspects- a formal discipline process utilizing formal HR practices and authorities, and an informal process which leverages small-unit consequences within a unit of the organization, outside of the formal process. This combination of history, structure, and indoctrination makes the fire service culture difficult or impossible to change (NFFF, 2014).

In the introduction to the 2008 symposium "Reducing Firefighter Deaths and Injuries: Changes in Concept, Policy, and Procedure" Dr. John Granito opened with the statement that the fire service needs to focus on organizational culture amongst other concepts and constructs to lessen the LODD toll within the United States Fire Service. He reinforced that current cultural practices for fighting fires in general and aggressively entering buildings, in particular, wellness, and vehicle operations with are all areas where improvement is needed. Smith (2010), Hodous et al. (2004), and the National Institute of

Standards and Technology (United States Department of Commerce, 2000) reinforce that the organizational culture of the fire service must change to reduce the annual toll of LODDs.

This culture of the fire service has evolved through a complex process of group learning (Thompson & Bono, 1993). In some cases in the fire service, methods espoused as solutions may be incorrect but perpetuated because they are viewed as traditions (Gasaway, 2005). Culture does not drive the actions; it results from actions such as these (Schein, 2012). The NFFF identified that fire department history and traditions can create a culture that is either difficult or impossible to change, and that fire departments may need to give up some freedom and better adhere to national standards to reduce LODDs (2014).

Simpson (1996) furthered the uniqueness of the culture of volunteer fire departments, describing them as a cultural resource for a community, as a link to simpler days. Lee and Olshfski described firefighters as unusually committed to their work, displaying a high level of pride (2002). This high level of pride produces an environment of competition and risk taking (Lee & Olshfski, 2002). Pessemier further complicates the view of fire department culture by stressing the local nature of these cultures (2012).

This image of the firefighter as a hero and extreme risk-taker is rooted in popular culture, with this concept washing over into the performance of duties based upon perceived public expectations of heroism, instead of actual job performance requirements (Eyre, 2014). This conception originated in the colonial fire departments, where the need for rapid response and competition to be the first to show up at a fire led members of fire departments to take great risk to arrive at the emergency scene and take control of the fire

quickly and with a lesser regard for personal safety (IFSTA, 2010). This trade-off of speed versus safety was explored by Colley, Lincolne, and Neal (2013), who found that there were negative balances at both ends of the spectrum. Following all rules can make it impossible to complete a job (such as fire suppression or victim rescue) promptly. Skipping steps or breaking rules can lead to increased risk of injury or death to the firefighter or his fellow firefighters, and could also lead to punitive organizational actions for failing to follow rules (2013). Heroism as a basic value or assumption may be an impediment to developing the situational awareness necessary to mitigate safely high-risk, low-frequency events such as fires, chemical releases, and other uncommon emergencies (Gasaway, 2013). For the number of Line of Duty Deaths to decrease, there must be a de-emphasis on heroism, with a greater emphasis on safety (IFSTA, 2010).

Lewis (2004) juxtaposed this image against the culture of firefighting:

> Firefighters around the world are heroes in the hearts and minds of the public. Nowhere was this more globally transparent than in the tragedy of 9/11 in New York. However, research into the culture of firefighting worldwide has also shown disturbing and quite 'uniform' characteristics have been normalized by many under the guise of tradition (p. 6).

Hulett et al. described the firefighting organizational culture as a perfect storm that has evolved slowly, resists change, encourages long-term employment, draws upon strong interpersonal connections, and takes pride in each of these areas (2008). Baigent, a firefighter-turned-scholar, identified five key areas of masculine-friendly feminine-exclusive organizational culture that are common in interactions between firefighters (2001):

a. Ostracizing anyone different
b. Ostracizing anyone who does not conform

c. Bullying and threatening anyone who resists the dominant group
d. Excluding outsiders from fire station life
e. Frequent joking as an instrument to continue bullying.

Archer concurs with this description of the fire service culture and elaborates on what he calls the discipline code, which "is highly prescriptive, promotes… from within the organization only… has long-standing traditions, and is predominantly white-male dominated" (1999, p. 94). He further discusses that this system is perpetuated through the cultural processes that individuals are introduced to when they go through the paramilitary style initial training. When members leave the fire service, five of the seven major reasons for leaving all surround the organization's culture (Whitney, 2012).

Baker-Thompson furthered the idea of larger departments having multiple organizational cultures and subcultures (2006). These might exist between different shifts, different stations, levels of membership, rank, or time on the department. Members of these differing cultures and subcultures may construct explanations and meanings that create a different reality than other group member's experience. Their emotional investment attached to these explanations and meanings can lead to change being viewed as challenging the status quo culture, leading to resistance (2006).

On March 29, 2015, a Fresno California Fire Department officer was operating on the roof of a residential garage fire when the roof failed, and he plunged into the flames. The report released after that investigation states that the contributing factors to the serious injury were "too common across the country," and "are those of the American Fire Service." The report further indicated that "Fire departments are made up of individuals. A fire department cannot change its culture and as a result improve the

safety of its employees without the commitment of each collaboratively working together" (Fresno Fire Department Serious Accident Review Team, 2016, p. 19). This report was one of the first to directly connect a serious injury back to the culture of a fire department and to review an injury with regards to fatality reports, finding 18 recommendations to be frequent across a decade of national fatality investigations. Of these 18, 12 are germane to the case being studied, despite the wide variance in department size, demographics, and type and victim age, experience, and rank.

The International Association of Fire Chiefs (IAFC) produced a paper in 2013 that identified five "Wicked Issues" that the fire service can no longer ignore. Culture was one of the five issues identified, along with political acumen, cost efficiency, data, and deployment/staffing. Similar to how the first Life Safety Initiative calling for cultural change from the National Fallen Firefighter's Foundation undergirds the subsequent 15 initiatives; the IAFC has identified a parallel set of issues grounded in the fire service organizational culture. Specifically, the IAFC agrees that the demand for fire department services is evolving, constantly changing, and less focused on fire suppression. It identifies that the environment of service delivery in the fire service is changing, and addressing organizational culture is critical for success.

Along with the IAFC, The United States Fire Administration (USFA) has added to the call for cultural change. In 2014, the USFA and IAFC produced a collaborative paper called the National Safety Culture Change Initiative which looked at both positive and negative aspects of the culture of the fire service in the United States. The three focal areas of the study were health and wellness with an emphasis on medical screening, vehicle safety in both emergency and personal vehicles, and incident risk management

(IAFC, 2014). The overall objectives of this National Safety Culture Change Initiative are to support the need for cultural change in the fire service by advocating for the need to change at the organizational level by incorporating personal responsibility and department leadership (IAFC, In Press). These same issues were identified by IFSTA as starting points in their discussion on cultural change as a part of overall occupational safety and health in the fire service (2010).

Schein stated that entering an occupation "involves not only learning technical skills, but also adopting certain values and norms that define the occupation" (2004, p. 8). In support of this, Daniels (2005a) insisted that the reason that firefighters respond without wearing seatbelts, are assigned to positions that they are not fully trained for, and enter hazardous environments without taking advantage of mandated personal protective equipment is "simply culture" (p. 53). Clark expanded this example of firefighters choosing to not wear seatbelts with the statement "We have the knowledge, we have the equipment, we have the standards, and we have the moral obligation," but the fire service isn't willing to impose a zero tolerance position to seatbelt use (Clark, 2015, p. 98).

Once an organizational culture is established, elements are passed on to new FD members in their orientation, indoctrination, and onboarding. Some items are shared in this phase while others are reserved until a new member is seen as a permanent member of the group (Schein, 2004)

As a recent tragic example, failing to have adequate training before responding to emergencies was cited as a contributing factor in the West, Texas fertilizer plant explosion in 2013 (NIOSH, 2014). Kluckhohn (1951) furthers this concept of culture as a choice by defining culture as a mental construct or conception which can be both

distinctly individual or a collective characteristic of a group, which influences how decisions are made.

Wilderom, Glunk, & Maslowski (2000) remind us that organizational culture relates directly to organizational performance. Therefore, since values are a component of culture, and culture predicts performance, changes to the values of the fire service must be done in a manner that does not have an adverse impact on the safety of the public.

Pessemier debunked this idea that the high LODD tally in the fire service is the result of firefighters taking greater risks and saving more members of the general public by the US having comparable fire loss expenses to other nations, higher civilian death rates, and firefighter LODD rates that are 4-6 times those of the United Kingdom (2012). The UK provides a reliable comparison due to similar tactics, a similar fire problem, and collects similar data to the U.S. (2012).

Kunadharaju et al. conducted an analysis of LODD investigations, and identified what he described as a cultural paradigm of firefighting. This paradigm included "Operating with too few resources, compromising certain roles and functions, skipping or shortchanging certain operational steps and safeguards, and relying on extreme individual efforts and heroics" (2011, p. 1179). He refers to these traits as long-standing traditions and how things have been done in the past, a form of normalization of deviance, more than a conscious, analytical choice to consistently engage in outdated or misapplied tactics, techniques, and procedures. While he recognizes that there is some effectiveness in the model, it values speed over safety, and identifies the need for understating this organizational culture of the fire service as critical to reducing LODDs.

In their root cause analysis of firefighter LODDs, Kunadharaju, Smith, and DeJoy (2011) identified multiple areas of risk with singular or limited points of failure. The authors argued that these causes "may actually be tapping the basic culture of firefighting" (p. 1179). They outlined the competition between time-sensitive outcomes (victim rescue and fire suppression) against safety and implementation of a management system at an emergency scene, and link simplification of strategies through a lens of the organizational culture of a given department serving as blinders to potential hazards on the fireground. This long-standing culture includes attributes such as "operating with too few resources, compromising certain roles and functions, skipping or shortchanging certain operational steps and safeguards, and relying on extreme individual efforts and heroics" (p. 1179). There is a high tolerance for risk, reinforced by past practices and inaccurate public perception, and a willingness for members of the culture to do whatever it takes to perform rescue and fire suppression activities. This study was one of the first to not only identify a need for cultural change but to probe the extant literature for root causes.

Unfortunately, this literature is largely limited to death investigations, and these investigations to not provide a deep or detailed analysis of the culture, adding credence to the position that the description of the organizational culture of the fire service has been widely neglected in the scientific literature. This limited source material for Kunadharaju's work is a specific limitation of their study, which considered over 213 LODD at 189 incidents over the period from 2004 through 2009. This case study is one of only two case studies probing the impact of organizational culture on LODD (Griffin, 2013).

Working Definition of Fire Department Organizational Culture

The preceding literature substantiated that there is indeed a unique culture within organizations, specifically the U.S. Fire Service, which begins with a paramilitary orientation and indoctrination process. This organizational culture can be changed, and the fire service history includes both positive and negative examples of such change. Successful change must be modeled at the highest levels of the organization, and the change must be reinforced at all levels throughout the organization. Changing culture is discussed in greater detail in the next section, but before moving forward a definition for what the organizational culture of a fire department is.

For this study, Chief Dennis Compton's definition for the organizational culture of a fire department was be utilized. It includes "all the behaviors, ideas, attitudes, and values shared by a group" of firefighters which is transmitted to current, new, and future members of the group (Compton, 2010). This definition is additionally inclusive of the assumptions, beliefs, observable traits, expressed rationales, strategies, stories, heroes, and traditions of a group of fire service members at a specific bounded level. These traits may be expressed through the organization's history, appearance, facilities, vocabulary, leadership, management, and supervisory approach and practices (Compton).

Values

While this study focused on the Modes of Implementation of an organization's culture, a definition of values as the core of the model is necessary to ground the model in the literature.

Schein described three components of culture: Artifacts, espoused beliefs and values, and basic underlying assumptions. Assumptions are taken for granted, not

debatable, and not able to be confronted, and values are a group's stance on what is right and wrong, what will and will not work (2004). Hofstede defines values as broad tendencies to prefer certain situations and outcomes to others (Hofstede, 2001). Patterns of culture are rooted in values, which make up culture, along with symbols, heroes, and rituals (Hofstede, 2000).

According to Soeters, values in the fire service are not distinct between personal and professional life (2000). This differs from most other professions, where it is expected that individuals have different values between personal and professional values, and only one value system in each area. Lang (1965) further describes the values in the fire service as a form of communalism, where individuals tend to seek out the same employment as their parents, tend to not look very far into the future (expecting the organization to do that for them), and select members based upon ties to the existing community. Soeters (2000) and Lang (1965) both also suggested that the organization's values reflect the national culture and values. Values that are as deeply rooted as these are most difficult to change (Gagliardi, 1986).

Deep organizational culture as found in a fire department is subject to change by an individual to the extent that the individual permits the values to be changed (Stackman, 2000). Using a paramilitary or boot camp environment to onboard and homogenize new employees helps to change individual values to align with those of the organization (Stackman, 2000) and serves to offer intense exposure to the values of the organization (Hofstede, 2000). The fire service uses these techniques to indoctrinate new members. This indoctrination process can be so complete those new firefighters often feel disenchanted when they leave the academy setting and are exposed to fire station life

because the adventure and excitement that characterized the training environment is not reflective of the station environment (Hofstede, 2000).

Theories of Cultural Change

Several models for organizational cultural change exist in the literature, but the unique aspects of this case warrant a model that allowed the researcher to understand the organization before and after the LODD, allowed for the study of an unplanned change, and took into account that there is a unique organizational culture present. Wilkins and Dyer reinforced this by identifying that a one-size-fits-all model of cultural change is inappropriate, as it does not account for unique characteristics, organizational history, the environment, and the organization's strategies (1988). With an organization that has the deep history and unique culture and characteristics as a fire department, matching the model for cultural change with the unique aspects of the organization is especially important. The model for organizational cultural change must be tailored to the organization, taking into account these individual variables (Wilkins & Dyer, 1988).

The work of Linda Smircich reinforced this need to match the model for cultural change with the specific attributes of the organization. She regarded this work as an intersection between organization theory and anthropology, with five major themes in the literature at the time. These five themes are comparative or cross-cultural management, corporate culture, organizational cognition, organizational symbolism, and unconscious processes and organization (1983). Her theme of corporate culture is the closest fit for this study, demonstrating that an organization produces its own culture as a product of its existence. However, her work stops short of advocating for models of cultural change but does offer touch points of the culture that must be considered for change to occur.

Silvester, Anderson, and Patterson shared that there is a lack of theoretical models for organizational culture change (1999). Their work studied organizational culture as the central focus for organizational change through an exploratory case study using a socio-cognitive model. Their research using this model was focused at stratified levels within the organization, aimed at measuring perceptions of a cultural change program at the management, trainer, and worker levels. They found that a single-shot program for cultural change could result in a positive intentional change at the technical and behavioral levels, with the technical change being more successful than higher-order changes. While this illustrates that change is possible, it reinforces that large-scale change, even when well-planned, can have results that fall short of the intended goal. The model used was appropriate for planned change, but less so for studying the impact of unplanned change, where accurate pre-change survey data is less available.

Schein identified that organizations may deny change even when necessary to avoid the discomfort and lack of psychological safety caused by the change (2004). In this case, there may have been a subconscious suppression of the need to accelerate the initial changes the chief began, and to strategically seek other areas where change was needed (2004).

Given that this case study involved a fatal incident, the work of DeJoy was considered due to his experience with organizational cultural change concerning occupational safety (DeJoy, 2005; Kunadharaju et al., 2011). He identifies that a culture change approach can be effective to address safety issues by identifying the root causes of unsafe behaviors while cautioning that these methods must be applied to more than just the top levels of the organization, and must be tied back to the specific culture of the

organization. His studies produced an overlapping mode for cultural change with regards to safety, with management changes or emphases "trickling down" to the workers, and front-line worker safety behavior changes "bubbling up." This model emphasizes the need for cultural change, places this model within an integrated approach, but doesn't address the details of how the cultural change can be implemented and led. Like both Schein (2004) and Gagliardi (1986), DeJoy links the organizational culture to how the organization solves problems (2005).

Cultural change strategies are traditionally aimed at improving processes or products in a thoughtful manner resulting in a change in a culture (first order change), or aimed at resolving an extant crisis which calls for a fundamental change of culture (second order change) (Scott, Mannion, Davies, & Martin, 2003). The key distinction is the need to change an outcome proactively versus a need to change as a result of a crisis, such as an LODD. The latter typically requires organization-wide change instead of focusing on one aspect of a system or organization and is a more complex process. In the fire service, change is most readily accepted by an agency that has experienced an LODD, and by those close to the event because the need for change is clear (Ford, 2012).

Changing Organizational Culture- Gagliardi's Conceptual Framework

The preceding review substantiated that there is a unique organizational culture within the fire service and that this distinct culture must be changed to reduce LODDs within the fire service. Gagliardi's model is a model that acknowledges the dynamic nature of a deeply-rooted organizational culture (Hatch, 2004). His model builds upon and expands Schein by relating culture to organizational strategy.

Gagliardi agreed with the view that organizational cultures are the result of dynamic organizational learning, and he developed a model to study if the organizational culture does change when the underlying assumptions change (1986). He considered the two positions that Schein offered as efforts to change organizational culture- positive problem solving and anxiety avoidance and found that organizational change is not so clean that it can be easily separated into these two categories to enable a successful planned organizational change. Schein agreed that there is a level of intertwining between the two concepts, but Gagliardi is more specific that the two concepts are irrevocably interrelated, finding that Schein's approach holds true for matters involving scientific knowledge, but less for change dealing with more tacit knowledge. Gagliardi offered that some deeply-rooted aspects of culture such as values and beliefs cannot be exchanged for a different value or belief to cause change. Instead, they must be replaced with new but complementary values and beliefs at the deepest level of organizational culture to allow for changes in primary and secondary organizational strategies, and more superficially organizational outputs.

Schein, Hofstede, and Gagliardi stratified the levels of organizational culture in similar ways, reflected earlier in figures 1.2, 2.1, and 2.2.

Gagliardi proffered that there were more options for cultural change, and greater potential for change, with aspects of the organizational culture proportional to the distance from the basic values. His model is an inverted pyramid, ranging from modes of implementation at the widest part of the pyramid, instrumental and expressive strategies at the second level down, primary strategy at the third level towards the base, and assumptions and basic values at the narrowest point of the inverted pyramid.

Modes of implementation- behaviors within the organization- would have the most acceptable options and require the least energy to change a specific practice, since these practices have a stronger foundation in scientific knowledge, and are more prone to direct observation and measurement. Fire suppression tasks, the step-wise performance of the work of the fire department, would be examples of such Modes of Implementation. Kimple supported that practices for both emergency and non-emergency response can be modified at this level in a move towards safer fireground operations (2013).

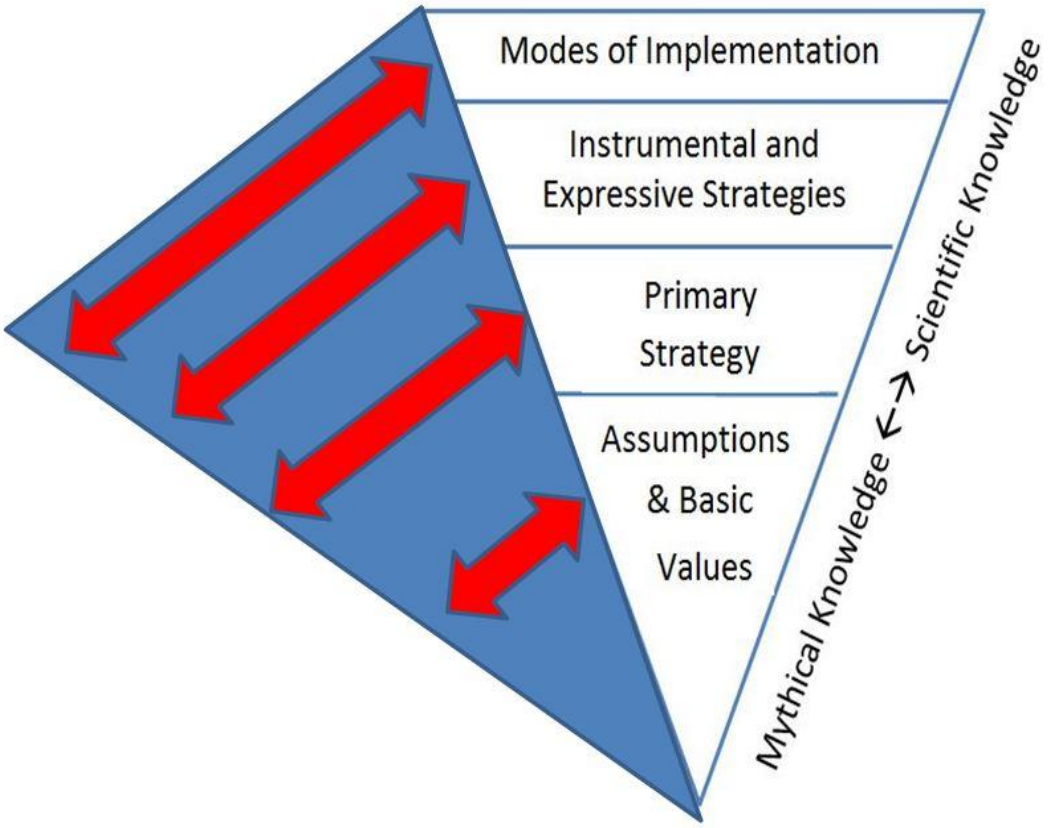
The next level of potential for action lies in instrumental and expressive strategies, which are the activities between actual practices/work and the maintenance of the organization's culture, which is the Primary Strategy. The third and increasingly harder aspect of organizational culture to change is the primary strategy. According to Gagliardi, the Primary Strategy of organizational culture is to resist change. Additionally, the more deeply embedded the Assumptions and Basic Values (fourth and lowest level of the pyramid) are in the Primary Strategy, the more change-resistant the organization is likely to be. The Assumptions and Basic Values are the very fabric of what the organization is and does. This area is most rooted in mythical knowledge, with few if any explicit reasons for the creation of these values are evident. Kimple supports that values and belief at the core of the fire service model, and believes that changes can be made here without impacting the delivery of emergency services (2013).

Meyerson and Martin also identified organizational cultures as being resistant to change and being changeable in small, incremental steps (1987). They close the gap between an organization's culture and the organization, identifying the culture as one

with the organization. Hatch supports this difficulty to change some cultures, by sharing that the more stable the culture is, the harder it is to integrate change (2004).

For success in making a change in this milieu, Gagliardi offered a concept he called Cultural Incrementalism, where the basic values aren't changed, but the number and scope of options to change tactics within the current values and assumptions is expanded. Meyerson and Martin supported the idea of cultural incrementalism, identifying small cultural changes as being more likely to be successful (1987). This incrementalism is reflected by the red arrows in the blue triangle in Graphic 4, and involves selecting additional values that aren't antagonistic to the existing ones, but different from them, and leveraging these expanded values to create new opportunities and solutions. He suggested adding an additional value without removing an existing one as a way to augment the Primary Strategy, which in turn allows for greater options for the Secondary (Instrumental and Expressive) Strategies, and ultimately additional acceptable options for the delivery of firefighting services in a manner acceptable to the organization's culture. Because values are hierarchical and not independent of each other, this model allows for cultural change with organizational growth.

Figure 2.3: Gagliardi's Model for Culture Creation and Change:



Gagliardi's work described how an organizational culture maintains aspects such as those shared by Archer, Baigent, and others. These "deeply rooted" cultures rely heavily on tradition and mythical knowledge (Gagliardi, 1986) and are difficult to change (Meyerson & Martin, 1987). He states that success reinforces organizational values, and leads to an idealized organizational culture. This idealization can lead to a lack of changing an organization's culture, as the indications of cultural stress or failure are minimized because they contradict the culture, or they are substituted by other aspects of the culture (1986). In these ways, from the initial indoctrination to the day-to-day aspects of the fire department, the thick organizational culture plays a significant role in maintaining the organization as it currently exists. Gagliardi sums this up with the

statement “Organizational cultures change to remain what they have always been” (1986, p. 126).

Gagliardi states that the more deeply rooted the values and assumptions are, the greater the organizational cost for the cultural change, and the less likely the change will remain after reinforcement activities have been relaxed. Firefighting culture forms such deep rooted, adamant intra-group bonds because the work they perform calls for them to function as a cohesive unit in the execution of emergency response operations (Moran & Roth, 2013). Of the three primary models considered (Hofstede, Schein, and Gagliardi), Gagliardi’s foundation in Schein’s model and similar levels to Hofstede’s model, along with the experience with entrenched cultures being changed via cultural incrementalism makes this model a good candidate for this study.

An important point made by Hofstede (2000) is that one way to change the values of a uniformed organization such as the fire service is to recruit more employees with values that are different or independent from the organization. Soeters and Boer (2009) found this to be the case to help reduce military aircraft accidents. By incorporating more civilians and fewer persons that had been indoctrinated into the military’s organizational culture, a shift towards a safer work environment ensued, and the number of aircraft accidents was reduced.

For illustration, the Phoenix Fire Department has shifted from a transactional service model to one of building longer term and deeper relationships by shifting from the basic value of “for service” to “for building long-term relationships” (Schneider, Bowen, Ehrhart, & Holcombe, 2000). Other methods suggested for lasting organizational change in the fire service are the Lewin change model, Kotter’s eight-step

change model, a five-step model consisting of Identify, Select, Design, Implement, and Evaluate, Social Change Model, and Social-Marketing Model (IFSTA, 2010). While IFSTA identified that these methods have been used in the fire service, according to the author there is no support in the literature of studies supporting their effectiveness in the organizational culture of a fire department.

Gagliardi further postulates that organizations do not learn from negative experiences without outside help and influences, for example from a person or group that can make decisions and observations from outside of the host organization's values and assumptions. In this model, internal change agents can identify and influence change at the outer edge of the model, but external change agents are necessary to create lasting change at the roots of the organizational culture. Kunadharaju reinforces this, calling for an increased study of culture in the course of Line of Duty Death investigations by federal agencies (2011).

Even with an external change agent, basic values and assumptions do not change if the members of the culture cannot or will not surrender the old values for the new ones. These are cases of what Gagliardi (1986) refers to as Cultural Revolution, versus cultural change. For lasting change to organizational culture to occur, he identifies three conditions that must be present for this model to work:

1. New competencies, practices, and skills must be aligned with existing values, or new values must be added to support the new competencies.
2. The organization must experience success as a result of the new skills, competencies, and practices, and
3. Leadership must connect the success back to the values after success occurs.

Chapter 2 Synthesis

A closing thought from Geert Hofstede (2000) serves as a fitting end to the discussion of the organizational culture in the fire service, and the need for a shift in these cultural touchstones to reduce on-duty fatalities. "Uniformed organizations have to balance their attempts to introduce new ways of working… with the necessity of preserving traditional basics. Changing uniformed cultures requires patience and wisdom" (p. 481). It is the intent of this research to develop some of the wisdom necessary to effect a positive change in the fire service by reducing the number of Line of Duty Deaths through first understanding the existing organizational culture of the fire department, and discovering how that fire department effected positive change using Gagliardi's model as a conceptual framework for that change.

Chapter 3: Research Methods

Despite a decrease in the number of fires, better protective clothing, and fewer civilians dying in fires, there has not been a corresponding decrease in firefighter Line-of-Duty Deaths (LODDs). This study employed a qualitative research design using a phenomenological case study method to describe one Midwestern fire company. Within the case, the organizational culture which undergirds the decisions and relationships in the fire department was studied. This chapter describes the research procedures used for the study.

The chapter is divided into thirteen major areas: Introduction, Research Questions, Research Design and Methods, Case Selection, Validity and Reliability, Data Triangulation, Data Collection, Data Management, Data Analysis, Participants, Researcher Background, Human Subject Protection, and concludes with a summary.

Restatement of the Research Questions

Three research questions guided this study:

RQ 1: What were the Modes of Implementation of the organizational culture of the fire department in 2010?

RQ 2: What were the Modes of Implementation of the organizational culture of the fire department in 2015?

RQ 3: Did the organizational culture of the department change from 2010 to 2015?

Research Design and Method

This study employed a qualitative design and case study method. Qualitative methods are best to describe, decode, and come to terms with the meaning of a naturally occurring phenomena in the social world. The raw materials of the study originate in the

daily environment of the subjects (Van Maanen, 1979). The process of qualitative research begins with the bracketing of a time and place to bound the study (1979).

Creswell defined a case study as:

> … an exploration of a "bounded system" or a case over time through detailed, in-depth data collection involving multiple sources of information rich in context. The bounded system is bounded by time and place... Multiple sources of information include observations, interviews… and documents and reports. The contest of the case involves situating the case within its setting, which may be a physical setting (Creswell, 1998, p. 61-62).

This case study was of the organizational culture of one fire department, as portrayed and described by the members of that department. The research focused on the people and events within this fire company, with consideration given to the environment and surroundings in which the fire company exists, and were time-bound to the events before and after the June 2011 Line of Duty Death (LODD). Two time periods were compared- fall 2010 and fall 2015.

The case study method is best suited for this study because it allowed the researcher to explore operational linkages within the organization over a period of time, and allowed the researcher to consider and explore a broad selection of evidence in the data collection phase (Yin, 2009). The case study was also appropriate for this situation because the study looked at the relationship between an event and the conditions surrounding it, in this case, the LODD and the impact on the organizational culture of the fire department (Farmer & Rojewski, 2001; Van Mannen, 1998). This study is interested in if a change occurred in the Modes of Implementation, how a model fits that change, and the study considered linkages between two time periods, all questions that are better answered through a case study (Yin, 2009, Stake, 1995, Mulenga, 2001)

A case study is further warranted for this study because the subject builds around the in-depth review of a contemporary phenomenon- the death of a firefighter. This death were studied in its real-life context, where the boundaries between the death itself and the context and impact of that death are not clearly evident (Yin, 2009). Some data emerged through interviews and observations collected from multiple sources (Stake, 1995, Creswell, 1998). Lastly, while there have been no research studies of single firefighter LODD, there has been one study of a nine-firefighter LODD using the case study method (Griffin, 2013). Griffin sought to understand if a change had happened, not how or why. Like Griffin, a researcher with a combined background in firefighting and scholarship can be successful in such a study (Van Maanen, 2011)

The research method was a single, holistic case study. According to Yin (2009) and Creswell (2009), this method was appropriate because it represents an extreme or unique case. This method allowed the researcher to examine a contemporary event without manipulating the environment while showing a larger perspective of the event and impact of the event. Using this approach the researcher was able to employ observations, group and individual semi-structured interviews, and document reviews to explore and develop a rich description of the fire personnel invited to participate in the study. This approach also allowed for a greater understanding of the case to appreciate its uniqueness and complexity.

According to Mulenga, while exploratory case study research must also be structured and focused (2001). The structure was ensured by using standardized tools for data collection and interviews to ensure consistency. Focus were maintained by seeking answers within the boundaries of the case, and adjusting the limits if/as necessary. The

goal is to answer the research questions, and not to capture everything that ever happened in this case. The tools used in this study were pilot tested in 2009-2010 during a different case study of a fire department, and refined with input from other experienced researchers and advisers following that study.

In an instrumental case study such as this, the research questions are selected first, before a case is chosen (Stake, 1995). Some issues related to the research questions flowed from the case selection, and others may present themselves as the case is studied. This method is further supported by Stake since a single case study design can be utilized to obtain meaningful data and an understanding of a complex phenomenon when resources are limited (1995).

This study employed a cultural study research design. This design is appropriate because a study of culture needs to be exploratory, given the complex nature of the topic. The absence of extant published research on the topic gives further justification for a qualitative approach to the topic. Additionally, the research data were verbal and observational in nature and requires interaction on the part of the researcher to study the values in action in their natural setting (Patton, 1990).

The case study method is further warranted because the researcher has no control over the firefighter's individual behavior, or the behavior of the group of firefighters, or the fire company. The researcher also cannot control the occurrence of emergency events. This study had a strong focus on contemporary events (Swanson, 2005) and allowed the researcher to identify themes and patterns of the case (Gall, 2007) which bear on the values of this fire company.

A case study allowed an in-depth, holistic study of the selected case (Creswell, 1998) while allowing latitude to explore the situation in detail (Flyvbjerg, 2006). The study of a critical event such as an LODD represents an extreme, unique case and is best revealed by a case study (Yin, 2009, Creswell, 1998, Flyvbjerg, 2006). Data sources for a study like this one are observational, verbal, and need to be studied in situ (Patton, 1990; Creswell, 1998). The flexibility of a case study also allowed the exploration of any positive deviance in the case, which aided in connecting this study into other cases (Patterson and others; Stake, during class). The case study method also permitted context-dependent general knowledge of a complex situation (Flyvbjerg, 2006; Mulenga 2001).

This method could have been limited if the case turned out to be substantially different than originally anticipated (Yin, 2009). To prevent this vulnerability, the case was screened before being finalized to understand the milieu of the case and limit potential major ethical, moral, or legal issues. Multiple cases were considered and narrowed down to ensure the best fit for the study of a successful change to a fire department's organizational culture. The selection process was based on the geographical location, researcher access to the organization, media reports surrounding the death, and a lack of controversy and litigation surrounding the case and published reports.

Additionally, sufficient interviewees were still living in the area, and available to the researcher, and they were willing to meet with the researcher. Finally, the researcher reviewed the case during the selection process and throughout the case study process to

ensure that the model, method, and design remain appropriate and were useful in explaining the situation of the case.

Criticisms of case study research exist, some of which are more misconceptions which can be addressed through thoughtful planning. To increase the value of proper and rigorous case selection, consistent and detailed data collection, thoughtful coding, through triangulation, and a structured reporting plan were closely adhered to (Flyvbjerg, 2006). The upcoming section addresses case selection, and a detailed plan for data collection, coding, and triangulation are shared in the next sections.

Case Selection

Case Selection began by defining a geographic limit of departments within a driving distance of 250 miles of the University of Illinois at Urbana-Champaign, which creates an area of roughly the states of Illinois and Indiana. The incident type sought was a fireground, non-medical LODD, as this was more likely to result in the type of organizational change sought for this study. Next, the availability of NIOSH reports regarding the fatality was used as selection criteria, since the prevalence of recommendations in the NIOSH is a point of comparison and analysis for LODDs in the existing literature. Lastly, the researcher accessed the United States Fire Administration (USFA) database of firefighter fatalities, which contains cases from 2003 and the data set ended (at the time of case selection) with 2012.

The search criteria put into the USFA database at apps.usfa.fema.gov/firefighter-fatalities/fatalitydata/reportbuilder were as follows:

- Year: 2003-2012.

- State of Fatal Injury: Illinois and Indiana (search was run once for each state, as multiple states could not be selected).
- Gender: Both genders
- Age Range: All ages
- Classification: (refers to the type of fire department) All classifications
- Cause of Fatal Injury: All Types
- Type of Fatal Injury: All Types
- Type of Duty: On-Scene Fire
- Type of Activity: All Types
- Type of Incident: Structure Fire
- Fixed Property Use: All Properties
- Additional Filters: No other filters were selected

This report generated four fatalities in Indiana, and 11 in Illinois, for a total of 15 incidents meeting the initial criteria. Reports and newspaper accounts of these 15 incidents were obtained and reviewed. Non-traumatic causes of death and types of fatal injury were eliminated from the search, which eliminated three cases where stress/overexertion was the cause, 3 cases where a heart attack was the cause, and 7 cases of asphyxiation. Note that there was overlap in the categories of Cause of Fatal Injury and Nature of Fatal Injury. After removing the medical cases, 5 cases remained, 3 of which were traumatic injuries, and the other two were crush injuries.

Since the five remaining fatalities were in Illinois, the next layer of scrutiny used the Illinois Firefighter Line of Duty Death (IFLODD) Database at the University of

Illinois Fire Service Institute Library. While the USFA database does not identify specific fire departments or individuals, by searching for the same criteria used in the USFA search in the IFLODD database, departments and individuals are identified. Applying the same search criteria used in the USFA search, five results were returned. The date range of LODDs returned in the IFLODD database were identical to those returned in the USFA search. Of the 5, once the incident was classified in both databases as occurring at a fire scene, but was vehicular in nature. Of the remaining four cases, three were in the City of Chicago, and one was in Downstate Illinois. All four had reports filed by the National Institute for Occupational Safety and Health (NIOSH) with details of the LODD and recommendations for prevention.

All four NIOSH reports were reviewed for the specific information of the case. The size of the fire department that experienced the fatality was considered, along with the complexity of the cases. The three Chicago cases would be difficult to study completely with the resources available. The researcher then began to collect additional information about the remaining case, including attending a seminar led by the fire chief which focused on the LODD event. After attending this event, the researcher met with the fire chief, shared information about this research project, and received initial approval and willingness from the fire chief to assist with the study.

The final selection criterion was to determine if there had been an organizational change within the organization as a result of the fatality. The remaining case in Southern Illinois was selected as a viable case after a discussion with peers of the researcher indicated that there had been an organizational cultural change in the department following the LODD.

Case Boundaries

Once the case was selected, the boundaries of the case had to be defined, along with what was meant by "fire department organizational culture." For this study, Chief Dennis Compton's definition for the organizational culture of a fire department was utilized. It includes "all the behaviors, ideas, attitudes, and values shared by a group" of firefighters which is transmitted to current, new, and future members of the group (Compton, 2010).

Fire department organizational culture can be described at the macro level (all fire departments in the world, in a nation, in a state, or in a region) if broad general characteristics are used, and the organizational culture can be described at a micro level (pairs, teams, or companies of firefighters, stations, districts, divisions, battalions, or departments) if more discrete criteria are applied. This study considered the Du Quoin Fire Department as the group for analysis, with input from outside persons to aid in triangulation and data validity.

Data Quality

Lincoln and Guba (1985) described four measures for judging the soundness of qualitative research and offer them as alternatives to external validity, internal validity, objectivity, and reliability. These measures are Credibility, Transferability, Dependability, and Confirmability

Credibility is based upon establishing that the results are credible or believable by participants and by the community at large. This were addressed by having the fire company members review the results before publication to ensure that the interview results are accurate, the conclusions are supported by the data, and the data is credible.

An informant and critical friends in the fire service, as well as the researcher's advisor and committee, also contributed to ensuring to a reliable result. This method would equate to internal validity in a quantitative study.

External validity is achieved through Transferability. This were determined by how representative the data is to the entire fire service. Since the study is qualitative, generalizability was inherently limited. However, aspects of the case study should be familiar to other fire agencies, even if the entire case is not. The thick, rich description developed as a result of the case study could allow transferability by offering characteristics that could be familiar within other fire companies. Some, but not all, of the report may apply to other fire companies. Generalizability is not a goal of this research, and external validity is the least important of the four measures of validity and reliability in this study.

Dependability calls for the researcher to ensure that the data is correct and in context for the study, ensuring that the methods used are appropriate for the research questions (Lincoln & Guba, 1985). As discussed above, the method of case study is well matched to the research questions and issues, and the data collected were triangulated as discussed in a later section to maximize accuracy and dependability. These two facets allowed the researcher to develop the case within the context that it occurs. While the case is dynamic, the researcher seeks to portray an accurate slice of time using these methods. Chart 1, Research Methods Correlated with the Research Questions, shows the anticipated methods for the parts of the guiding research questions.

Lincoln and Guba's (1985) last indicator is Confirmability, or the ability for the data to be verified and repeated. This indicator is also referred to as "objectivity"

(Marshall & Rossman, 1989). To ensure this trait for this study, an audit trail was maintained so that the full records of activities related to this study were captured and available to other researchers. This audit trail includes rough and final notes, coding devices, and initial categorization forms. To aid in Confirmability, the study considered the most observable part of Gagliardi's model, the Modes of Implementation (MOI). These are the most scientific aspects of behaviors that were recorded in observations and captured during interviews. Schein supported this level of analysis by referring to Gagliardi's model and stating that going deeper requires the researcher and the subjects to have an understanding of the "deep assumptions of the culture… and you can only test a person's insight into what something may mean if the person has also experienced the culture at the deepest level of assumptions (2004, p. 24).

While no study can be a completely accurate depiction of the organizational culture of the fire company studied, through adherence to the constructs of Credibility, Transferability, Dependability, and Confirmability this research strives to be as true and accurate as possible. Additionally, the level of analysis was bounded by the MOIs while not being superficial, avoiding the trap of developing a deep understanding from insights that may not be present from the brief time spent with the department for this study.

Data Collection

This study relied heavily on fieldwork. Van Maanen advocates for fieldwork as a primary source of data for "little understood and out of the ordinary" cultures such as fire departments (1998, p. 31). Fieldwork allowed the meanings and practices produced and sustained by the group as Modes of Implementation to richly erupt in the narrative.

Because data collection is emergent in case study research, there was no precise moment when the gathering begins (Stake, 1995). Some data was necessary to screen cases for selection. For this researcher, the study drew upon his expertise in the fire service and his experiences as a Human Resource Development student for the previous decade as well as the information collected in the study. As is common with case studies, data were drawn from interviews, documents, and historical records as well as researcher observation (Stake, 1995).

The study began with document review and observation, and on the researcher's second visit to the site interviews were conducted. Interviews had some core questions asked of each member using an interview guide, and also had specific content to each member of the fire company based on observations, perceptions, and the member's time and position within the company. The interviews were tied back to the research questions and issues, but also leave the researcher time and space to follow the discussion where it leads.

Chart 2: Research Methods Correlated with The Research Questions diagrams which methods are expected to be used for each research question. Two strategies for data collection used within these methods were adopted from Gall, Borg, and Gall (1996). Standardized forms were used to collect each of the three types of data, and these forms are included in the appendices. The research plan also called for the interviewer to probe during questions when the interviewee had more to say. This provided a thick description, deeper details, and direct quotations which helped to begin to formulate a mental image of the data, allowing the researcher to begin to anticipate categories for coding while still being engaged in data collection.

Table 3.1: Research Methods Correlated with Research Questions

	Document Review	Observations/ Artifacts	Interviews
RQ 1: What were the Modes of Implementation of the organizational culture of the fire department in 2010?	XX		XX
RQ 2: What were the Modes of Implementation of the organizational culture of the fire department in 2015?	XX	XX	XX
RQ 3: Did the organizational culture of the department change from 2010 to 2015?	XX	XX	XX

Document Review

The documents reviewed included the department's governing documents, including its mission and vision statements, Standard Operating Guidelines/Procedures (SOGs/SOPs), policy manuals, union contract, and historical documents. The latter documents were used to add depth to the situation that the fire company works in, as both the union contract and the department's history shed light on the current state of affairs. A document review guide was used to aid in consistency of the information collected.

Observations/Artifacts

The fire department building in general was directly observed by the researcher on the first and second visits. Field notes were taken on a standard form to allow for easier analysis and organization. The station, equipment, and living areas were documented. Observations were used to triangulate data collected from both the document review as well as interviews. The researcher observed the fire company members during their performance of routine work in their fire station, during training, and while out in the community for non-emergency reasons. These observations were triangulated through interview data. Field notes were organized shortly after the collection while the event is still fresh in the researcher's mind to minimize data loss.

Interviews

The last method of data collection gathered was interviews of each participating member of the fire company. Each firefighter and interview participant had their unique story to tell which contributes to a deeper understanding of the case. Interviews began with a discussion of the research itself, and a review of the informed consent form. This introduction was followed by straightforward demographic questions to establish rapport and help both the researcher and the interviewee become at ease with each other. Next, semi-structured open-ended questions drawn from an interview guide provided consistency between interviews for triangulation of core information while allowing the researcher to tease out details about specific answers provided by the interviewee. This structure allowed each interviewee to share the uniqueness of his or her role and position in relation to the company as a whole. These questions were provided in advance to allow the company members to reflect and prepare for the interview, and to lessen their anxiety during the interview. Lastly, each interviewee was asked some questions specific

to his or her role in the fire company. All interviews were digitally recorded, and transcribed verbatim then checked for accuracy by another person. The interviewees were given an opportunity to review the transcript for accuracy, as well as make additional comments on his or her statements to deepen further the case record.

Interviews were scheduled during the first meeting with the fire company, but were not be conducted until the second or later visit. By conducting the interviews on a second or later visit, the researcher was somewhat known to the group and was able to elicit richer information from the participants. The time, duration, and location of interviews was recorded.

Interviewees were assigned a pseudonym known only to the researcher. They were identified as a firefighter or an officer, and the department the individual is from was not be identified. The pseudonym log was maintained with the consent forms.

Ending Data Collection

Collection of data in a study such as this can go on almost indefinitely. The researcher could always find another question to ask, another interview to conduct, or another item to triangulate for inclusion. The decision to end data collection considered having sufficient data to triangulate key coding categories, MOI, and data repetition in general. Data collection continued in this study until data began to be overextended- the additional information gleaned from subjects did not extend the categories, MOI, or study in general.

Data Triangulation

Triangulation refers to verifying information from multiple sources. Member checking involved having interviewees check quotations in transcripts of interviews for

accuracy. Triangulation also played a role in the confirmability by ensuring that critical information has been verified by more than one source. According to Stake, the need for triangulation is related to the type and use of the data. Data that is trivial or beyond question, or is an interpretation made by the researcher, has little need for triangulation. A description that is relevant and debatable, a moderate need for triangulation exists. Lastly, data that are critical to assertions or are controversial require strong triangulation (Stake, 2010).

Norman Denzin identified four types of triangulation, methods that can be used in the situations described above. These are to use multiple investigators of the same phenomenon, use multiple participants to develop a depth of perspectives, use of multiple methods (interviews to support observations, historical documents to verify interview data), and lastly Theoretical Sampling. This last concept for triangulation is applied by determining if conclusions can be generalized to other time periods or other locations, or if conclusions can be applied from groups to individuals within the group, from this group to similar groups, and from this group to a larger set of firefighters, for example, an entire shift. Given the particularity of this case study, this last method may be least effective and practical. Emphasis was placed on using multiple methods and multiple participant interviews to ensure triangulation (1989). Multiple investigators and theoretical sampling were not used.

Data Management

The researcher applied two data management strategies recommended by Gall, Borg, and Gall (1996). First, a standard format was used to make field notes as well as for making summaries. Standard forms were used to record specific details about people,

events, and situations, and to generate additional questions to be asked of other company members during their interviews. Ideas for presenting the collected information were captured on the standard forms so that the researcher could start to structure the case as it presented itself.

A system of coding, organizing, and retrieving the data was utilized. Multiple back-ups of electronic files and copies of notes and hard copies were made to minimize the potential for data loss. These copies were stored in more than one location. Audio recordings were made with a high-quality digital recorder. A master list of data types was used.

Data Analysis

Data analysis was interwoven with the collection process, as the meanings and relationships that are uncovered led to a better understanding of the case.

A general strategy was used to analyze more formally the data following all data collection. First, all data was reviewed, with notes being made as to how the data fits into a description of the case. Next, themes were established to begin to reduce the raw data to a more manageable form. Areas of change were identified during interviews, and later member-checked to ensure an exhaustive list. Third, the data was described, classified, and interpreted using categorical systems that emerge from deduced meanings of the material.

The first stage of analysis utilized a classification system, coding, and thematic categorization. The second stage of analysis drew connections within and between the themes leading to analysis and interpretation. In the first stage, data was member-checked and/or triangulated to ensure data fidelity. This led to the development of major topics

within the first two research questions. These topics were grouped together into broader categories which became the groupings for analysis in Chapter 5.

Chapter 4 was written as a realist tale (Van Maanen, 2011) with experiential authority from both the theoretical model used and the researcher's depth of experience in the field along with his training and education as a researcher. The fieldwork was tied to a particular problem, providing the researcher with insider access that Van Maanen identifies as crucial to fieldwork (2011).

A fragmentation approach was used to preserve the variety of viewpoints. According to Gagliardi, using this framework helps to codify, organize, and share cultural research (Martin, 2002). Fragmentation allowed multiple meanings, multiple views, and the presence of disagreement and ambiguity to come through in the narrative and analysis (2002).

Participants

The participants for this case study were selected by the researcher based on the length of time they have been a member of the department, how engaged they are with department activities in 2015, how engaged they were in 2010 before the LODD event, and with input from the chief of the department. A selection of persons on the department before and after the Line of Duty Death was sought to ensure an accurate picture of the organizational culture before and after the death. Additionally, persons familiar with the department's changes in the prescribed period were interviewed to aid in the triangulation of data from within the department.

Prior to beginning the study, reports of the incident and the organizational structure of the fire department was reviewed. All full-time members on the department

consented to being interviewed, along with a convenience sample of the active part-time members of the department. When a participant suggested that the researcher contact a specific additional person to interview, the researcher attempted to contact the individual. These additional interviews of persons outside the department provided triangulation of the collected data, provided an outside perspective on what the changes meant, and helped add depth to the fragmented story of how change happened.

When other information that helped capture the story of the fire department being studied or would help the researcher understand the case, that information was also considered. These became vignettes that helped tell the story, including a similar LODD that occurred 15 miles away and 15 years earlier and the specific events that happened on the day of the LODD.

Researcher Background

Since this study focuses on a fire department, it is helpful for the reader to understand the researcher's background regarding the fire service. At the time of the data collection, the researcher was employed by the state's statutory fire academy and had worked there for 15 years delivering training and education for emergency responders, developing curriculum based on needs from the field as well as from national standards, and conducting research within the fire service. He entered the fire and emergency services in 1990, and has experience as a firefighter and fire officer on a volunteer department, and had colleagues, students, and peers in the geographic area of the studied department that allows him better access than a pure civilian researcher would have.

The researcher's experience in the fire and emergency services allowed for a native's point of view of the case while allowing objectivity and balance from his training

as a researcher (Van Maanen, 2011). The researcher ensured objectivity during the study, and focused on the research topic more than a general interest in the organization. He also ensured that he was not seen as an agent of the state fire academy conducting an investigation, but seen as a researcher conducting a study.

Human Subject Protection

In all research, actions must be taken to protect the participants, as well as other aspects of the case. For this study, the following measures were taken to protect human subjects:

1. The researcher had completed all required training programs for human subject protection for research at the University of Illinois.
2. The University Of Illinois Bureau Of Educational Research had approved the research project before starting.
3. Two experienced case study researchers reviewed the project and oversaw a pilot study at a different location.
4. A dissertation advisor and committee were guiding the researcher.
5. Participants were informed both verbally and in writing about the purpose and procedures of the research. This included a description of what was asked and expected of each participant.
6. Participants signed an informed consent form demonstrating their understanding of the study's goals and methods, as well as their willingness to participate in the study.
7. Participants were able to terminate their participation at any time.
8. Participants were notified when audio recordings were made.

9. Transcripts were provided to each participant for him or her to correct the transcript, and clarify their statements before the use of controversial quotations.

Chapter 3 Summary

This chapter contained an overview of qualitative research about this study and an introduction to case study methodology. The rationale for case selection was discussed, along with the concepts of credibility, transferability, dependability, and confirmability described instead of validity and reliability. Methods of data triangulation, collection, management, and analysis were all discussed. Participant selection was shared, the researcher's background as it pertains to this case was revealed, and methods of protecting human subjects was discussed.

Chapter 4: Research Setting

This chapter provides a history of the community of Du Quoin; an overview of the Du Quoin Fire Department; the family ties that bind members to the DQFD; the connection between the DQFD and a program at the state fire academy; a fatal fire in Hurst, Illinois that is very similar event to the June 2011 fatality on the DQFD; a leadership change at the DQFD; and the fireground death of a DQFD member that occurred in June 2011.

Three particular events which impacted and shaped the change are included in this section to identify the origin of some of the changes that were revealed in the study. The first episode, "Smoke Divers," taps into the historical aggressiveness of the fire department, an origin story of sorts for the values and assumptions of the department related to their fire suppression methods in 2010. The second episode describes a fireground LODD from Hurst, Illinois. The death of Kevin Reveal at this fire is a nearly identical LODD that occurred 15 years earlier and 15 miles away from the Du Quoin LODD. The Du Quoin Fire Department chief who was promoted in April 2010 was at this fatal fire, and his experiences at the Hurst LODD fire helped shape his overall command philosophy as the organizational leader and also drove his decisions at the incident where Du Quoin LODD occurred in 2011. The final episode captures the promotion of the department's training officer to Chief of Department in April 2010.

The inclusion of these historical anecdotes is supported by Schein in his statement "If we want to analyze organizational cultures we should reconstruct their histories and look for the critical defining events in their evolution as organizations" (2012, p. 2)

When the study was selected the researcher was not aware that the promotion and leadership changed had occurred in 2010; the period was selected to give a point of reference to ask about the department before the LODD. Ruling a leadership change in or out was not part of the case selection criteria. It was revealed through the interview process that many of the changes that were originally attributed to the 2011 LODD were more directly correlated with this leadership change.

The City of Du Quoin

The city of Du Quoin was settled in 1803 by the Kaskaskia Tribe and named for the chief of the tribe, Jean Baptiste Du Quoin. The son of a Frenchman and a Tamaroa Indian (sic) woman, Du Quoin staked out property in the area currently known as Old Du Quoin, an area of seasonal Native American hunting camps. Growth in the area was accelerated and the original settlement moved west with the opening of a rail line that extended from the Great Lakes to the Gulf of Mexico in 1840. The city was officially commissioned on September 20, 1853.

Strip mining was common in the area, and in the 1920s, William R. Hayes reclaimed the land that is now home to the Du Quoin State Fair. The fair was held the week preceding Labor Day beginning in 1923. Hayes had a vision of creating the experience he'd had at the 1904 World's Fair in St. Louis in the community of Du Quoin, located 90 miles to the southeast of St. Louis (Mathis, 2002) in Perry County, Illinois. He named the event the Du Quoin State Fair to garner the same class and respect as the official State Fair, held a week earlier in the state capital of Springfield. The initial fair had harness racing as a cornerstone, along with automobile racing, car and dog shows, a

speech by the governor, a flying circus with parachutists, and a "dirigible from Scott Air Force base as the grand finale" (Illinois Department of Agriculture).

Hayes constructed an opera house in Du Quoin, along with a chain of movie theaters and a Coca-Cola franchise. He located the local Coca-Cola bottling plant on the land adjacent to the fairgrounds and indulged his love of harness racing by creating a track that hosted the Hambletonian race starting in 1957, where it ran for 24 years.

One of the current officers on the DQFD is a grandson of William Hayes. He shared that the Hayes family has strong connections to resources, being able to acquired tons of metal to build the fair grandstands during World War II at a time when most construction resources were being diverted to building equipment for the military.

The Hambletonian ran on Du Quoin's "Magic Mile" clay track until it relocated to the New Jersey Meadowlands in 1976. It was quickly replaced at the Du Quoin Fairgrounds by the World Trotting Derby.

The Du Quoin State Fair was operated during World War II when the Illinois State Fair was shut down for wartime use. In 1986, the State of Illinois assumed management of the Du Quoin State Fairgrounds, and the tradition of having a second state fair continues to this day. The Du Quoin State Fair draws more than a quarter million people to the area for the 10-day event and remains the largest spectator event in southern Illinois.

The Du Quoin state fairgrounds is an economic driver for the community, and the size of the fire department is a byproduct of the frequent use of the grounds for racing, monthly flea markets, fireworks, and the annual Holiday Lights Fair. Officer 7 added that the population of the town could increase by thirty to forty thousand people

depending on what event was at the fairgrounds on a given weekend. He views the visitors as being in the community, and as being part of the DQFD's responsibility.

A different view of the community comes from an officer who describes the town as having "old buildings, poorly maintained," with "70 percent of the families living below the poverty line" in "crowded conditions." Corroborating this another officer describes that the high school used to have 500 students, and now it is down to 300-350 students. Three large factories in the area have closed in recent years, leading to more families and workers leaving the area. This has impacted the fire department because the buildings are poorly maintained, there are more vacant structures, and there are fewer residents to serve as volunteer members of the department.

The Du Quoin Fire Department

The DQFD was founded in 1853 as a volunteer fire department. The first full-time chief was hired in the late 1950's. The ranks continued to grow through the mid-1960s when three full-time staff, each working a shift each third day, were hired. The current Fire Chief is the longest-serving contemporary member of the department. He was hired in 1983 to fill a newly-created full-time position labeled, the "7th man," which allowed the chief to work days. Two firefighters were on shift each day, and the chief moved from a shift (working every third day) to working Monday through Friday.

The current fire chief responded and assisted at his first structure fire wearing his station uniform because his firefighting gear had not arrived yet. At the time, the fire department living quarters were located in the former tack storage area, suspended between the apparatus bay on the ground floor and the city council meeting space on the top floor. There was one door in and out of the living area. The walls were knotty pine

paneling, and in 1983 and everyone on the department smoked cigarettes and did so inside of the station. In 2015, no one on the full-time staff is a smoker.

The main fire station was erected in 1988 and sits at the intersection of a state route and a business-lined street one block off of the main street in Du Quoin. The station sits on a corner lot, and the apparatus bays empty out onto State Route 51, a meandering trail through town. A door for personnel to enter on the side of the building adjacent to the bay doors. Between the bay doors sit concrete Dalmatians and a flagpole, flying the largest American flag in town. The bay doors are often open in pleasant weather, signaling the firefighters are working in the bay. There is no marking on the front of the building identifying it as the fire department.

To the immediate west is the Redenour Overpass, a bridge built in 1995 over the railroad tracks. Before this bridge, there was a second fire station on the opposite (west) side of the tracks. The bridge was erected through the work of former Mayor John Redenour who served on many local boards and was the chair of the state Democratic Party. Officer 3 recalled seeing photographs of Redenour with three sitting presidents in Redenour's office.

After construction of the bridge, the second fire station was moved to the growing southern edge of the community, closer to the fairgrounds. It sits roughly two miles south of the main fire station, along the same state route and adjacent to the Du Quoin State Fairgrounds. The building formerly housed a utility company, but now is used by the fire department and other public safety agencies. However, most of the building is unused; the fire department only utilizes the indoor parking area and bathrooms.

In the main station, artifacts and décor remind the employees and volunteers of the DQFD's (sometimes difficult) history. When the researcher shared the overview of the study, one firefighter laughingly shared that the department held onto rotary phones as long as possible. Shelves contain albums with photographs and news clippings dating back to the 1960s. A diner-style menu board with individual plastic letters lists current, past, deceased, and the one LODD member. Additionally, there is a 3' x 4' black and white poster of a photograph of the LODD firefighter, his helmet slightly askew and an uneven smile. Sheets of blueprints and building plans are unrolled on the bar in the kitchen- a new addition to the station, a byproduct of building inspections. The kitchen/living room area is centrally located within the station, and firefighters can access the sleeping quarters and bathrooms, apparatus bay, and offices each from a different doorway.

While a rigid hierarchy exists on the emergency scene, the feel around the station is more collegial. When the fire chief makes a trip to the store, he often asks what the on-duty crew might need before going. Even within this informality, there is still evidence of the rank structure. When the chief is out of the building, the junior firefighter answers the phone and door without being told to by the senior man. There is no overt communication or gesture between the two FF that indicates who should answer the door or phone; it is an understood organizational-cultural norm.

Emergency calls used to be managed directly through the fire department but are now routed through an emergency call and dispatch center in Du Quoin. There was much angst with this change, including concern from the FD members that their response times would be increased and their level of service diminished.

EMS is now provided from the nearby town of Pinckneyville, with an ambulance staged in Du Quoin. The FD operated an ambulance until it was decertified by the state in the late 1980s. There was great concern about no longer providing this service, but the increasing demands of licensure were more than the department could manage.

Regardless of these reductions, the DQFD continues to provide services to 11,000 residents (NIOSH, 2011) in over 85 square miles, with 6,500 residents in the urban center of the city limits of Du Quoin. While comparable communities in the area typically employ three full-time firefighters, the businesses and industry that grew in support of the Fairgrounds and along the railroad led to a larger fire department for Du Quoin. Presently, the DQFD employs seven full-time firefighters who are supported by a handful of volunteers. Departments such as the DFQD with paid and volunteer members are commonly referred to as 'combination fire departments.' The study department is the only paid fire department in Perry County, Illinois. The closest career departments of similar size have 5 and four full-time members. There have been several historical attempts, via referenda, to convert the department to fully volunteer to staff but each ballot has shown the public's support for the fire department's current organization. The career members of the department are not unionized, which is uncommon for the area.

Family Ties

The fire department self-describes as a family. "The guys are from here, and their families are here." One officer was close with an uncle who was a Marine and firefighter. This led him into both the USMC and the fire service. His son had firefighting "in his blood and joined the department as soon as he was old enough. He was doing something he enjoyed doing, and he was protecting his community." One FF

shared memories of coming to visit his father at the department, going to the Christmas parties, and watching his dad go on emergency responses. He was drawn to this fire department, admired the work they did, and always knew it was something he wanted to do if given the opportunity. His father served on the department for 26 years, retiring in 2009.

Another firefighter had a stepfather on the department for 34 years, including time as chief. A third firefighter's father joined the DQFD in 1983 and retired in 2009. "I've been in this department my whole life, and I grew up with everybody and knew everybody, they are all considered family to me." He grew up wanting to be a FF from seeing his dad do the job and seeing the camaraderie of the department. An officer's father was a local volunteer, and he became interested in firefighting in college. He was hired in 1996. A different full-time member's father retired from the DQFD as chief. He always wanted to be a firefighter and was hired full-time in 2009. In all, 5 of the seven full-time members are second- or third-generation firefighters.

One firefighter captured the June 2011 LODD as "The loss was especially hard because Corey was just like me. He grew up with the fire department just like me. It was personal. It was personal for everybody just because they knew him for so many years."

"Smoke Divers"

The first SCBA the department owned came from the local civil defense agency, and the chief at the time had a strong military background and supported this new method of fire attack. Two other firefighters who came on near the same time as the new fire chief were sent to the University of Illinois Fire Service Institute shortly after each was

hired to attend the Advanced Breathing Apparatus Specialist or "Smoke Divers" program.

While core competencies were taught within the department by senior members, the Smoke Divers course was the first class that new full-time members were sent to gain a more comprehensive understanding of the capabilities and limitations of their Self-Contained Breathing Apparatus (SCBA). The program was created in May of 1976, and offered biannually at the state fire academy located three hours north (Ehrenhart, 2015). The devices were still relatively new to the fire service, and by having in-depth knowledge about the equipment the Du Quoin Firefighters were more aggressive than neighboring fire departments. Upon completion of Smoke Divers training, Du Quoin FF would go out and help train neighboring departments.

One officer describes Smoke Divers as "the single best class I have ever taken." He shares a story of responding to a fire in an apartment above a furniture store in a neighboring town with a young girl trapped in the apartment. The ceiling had collapsed, and there were wires that entangled the firefighters. This officer used tools and techniques from the Smoke Diver's course to enter the apartment, make his way to the girl's room, and rescue the girl by cutting their way out of the room.

A drawback to the Smoke Diver's program was that it was viewed by this fire department as terminal training- the pinnacle of training that a firefighter could receive. Firefighters believed that they had received the top tier of training, and many did not seek knowledge after that.

LODD in Hurst, Illinois, 9/29/1996

Herrin firefighter Kevin Reveal was killed at a mutual aid structure fire in Hurst Illinois on September 29, 1996. His crew had been operating outside of an older masonry building, helping to pull plywood down to uncover window openings so that hose streams could be directed inside (IFLODD, 2015). During this activity a wall collapsed onto him, burying him in beneath the bricks. He was pulled from the rubble, transported to Herrin Hospital, and pronounced dead on arrival.

Officer 1, a Captain on the Herrin Fire Department, was at the fire, and when he arrived he meet with the chief of the Hurst Fire Department. The chief admitted he was over his head, and asked Officer #1 to "take control and figure out what we need to do." Officer #1 shared that the attitude his company brought to the fireground was one of "there ain't (sic) a fire we cannot put out." One of the other departments heard the wall crack and start to fail. There was a Halligan bar on the ground at the base of the failing wall, and Herrin Firefighter Kevin Reveal went to retrieve the tool. As he leaned over to pick up the bar, the wall collapsed onto him.

Officer 3 from the DQFD was a captain at the time and was also at this fire. He recalled standing behind a group of chief officers that night, listening to their discussion about the hazards of going inside the building. By listening to their discussion, they had no idea that the structure might collapse. He had researched it to understand what happened.

Following the loss of Herrin Firefighter Reveal in Hurst, there was a tactical change within the Herrin Fire Department. The new attitude was "it's just a building." The department began to pay more attention to keeping track of members at larger incidents and sent department members to learn more about rescuing firefighters in

classes at IFSI. They expanded the size of collapse zones around buildings and looked at "death trap" buildings in their community more closely. They also started the "clock" of fire damage from when the fire started or when they were notified, not when they were dispatched. In the case of this fire, the fire department was on scene for 40 minutes before calling Herrin for help, and it took 10 minutes for them to travel to the fire.

Leadership Change at the DuQuoin Fire Department

Returning to the DuQuoin Fire Department, Officer 3 was promoted to Fire Chief in April of 2010. He was a fixture of the community, and when we went to lunch during an interview it seemed that everyone in the restaurant and on the walk there knew him and greeted him by name. To them, he was both the Fire Chief and the town's football coach.

The outgoing fire chief oriented the incoming chief simply, giving him a set of keys to the building and sharing which filing cabinet contained financial paperwork and which contained personnel and training information. The outgoing chief assured him "You'll do great!" as he left the office. Officer 3 was also admonished that "This is Mayberry- don't screw that up!" This instruction ran contrary to the new chief's desire to develop leaders at every level in the department, to modernize the department, and for the department to be successful and sustainable into the future.

He took the job with conditions. He wanted a larger budget for training and requested an increase from $2,500.00 (which was typically spent on operational needs instead of training) to $15,000.00. The city council approved $5,000. He developed a five-year improvement plan for the fire department and educated the city administration on which state and national standards were not being met by the department. His vision

was based on articles he'd read in firefighting trade magazines and from classes he'd attended the University of Illinois Fire Service Institute.

When promoted he had a vision of what he wanted to "fix" in the department. He knew that the department needed better training and education and that he would need to break through the attitude that "we're too good of a department" to need to change.

From the outset, he felt that he was "going to be an unpopular chief" because of the changes he anticipated making to the department. After his appointment to Fire Chief, he established the rank and position of Captain on the Du Quoin FD. He implemented building inspections. He implemented requirements tied back to state and national certification that had to be met before being promoted to Chief or Captain. The Assistant Fire Chief was sent to classes to complete his initial fire officer certification and quickly was sent out for classes to complete the second level of certification.

"I want leaders" was how the new fire chief described his leadership vision for the department. "I knew that we could not continue with the way we had been doing things. We needed to train and needed to grow and learn."

Accountability systems provide a means of keeping track of emergency responders and tasks during emergencies. The previous fire chief had refused to implement an accountability system for tracking firefighters at emergency scenes. He was quoted as having said, "as long as I'm here, we won't have an accountability system." Because the department had the only ladder truck in the area and was frequently called for mutual aid to other communities, implementing a system for tracking personnel was a high priority for the new fire chief.

He characterized previous chief officers as men that "did the best they could with what they knew how to do." They weren't aware of some of the dangers that lurked in burning buildings or the additional dangers created through the act of extinguishing fires.

The new chief was appointed in April of 2010. In May of 2010, he and his assistant chief attended a course entitled "Fire Officer of the 21st Century" at a local community college put on by the Illinois Fire Chief's Association. This session helped to reinforce the vision the chief had for where the DQFD could be, and provided a network and resources to leverage for the desired changes.

The chief has been in office since April of 2010, working out of a physical office which is sparse and unassuming. His desk is a six-foot folding table, with the March/April 2010 calendar still tacked to the wall above it more than five years later. Memorandum and notices are attached to the wall with tacks or tape. The desk faces one wall, and each of the other three walls contain framed quotes that the chief attributes his success to. He shares that one of the three quotes gets him through each leadership decision he needs to make. The quotes, all in black wooden frames, are:

> "The best executive is the one who has sense enough to pick good men to do what he wants done, and the self-restraint to keep from meddling with them while they do it. – Theodore Roosevelt"

> "A leader is best when his people barely know he exists, when his work is done, his aim fulfilled they will say; we did it ourselves. – Lao Tzu"

> "The challenge of leadership is to be strong but not rude; kind, but not weak; be bold, but not bully; be thoughtful, but not lazy; be proud, but not arrogant; have humor but without folly. – Jim Rohn"

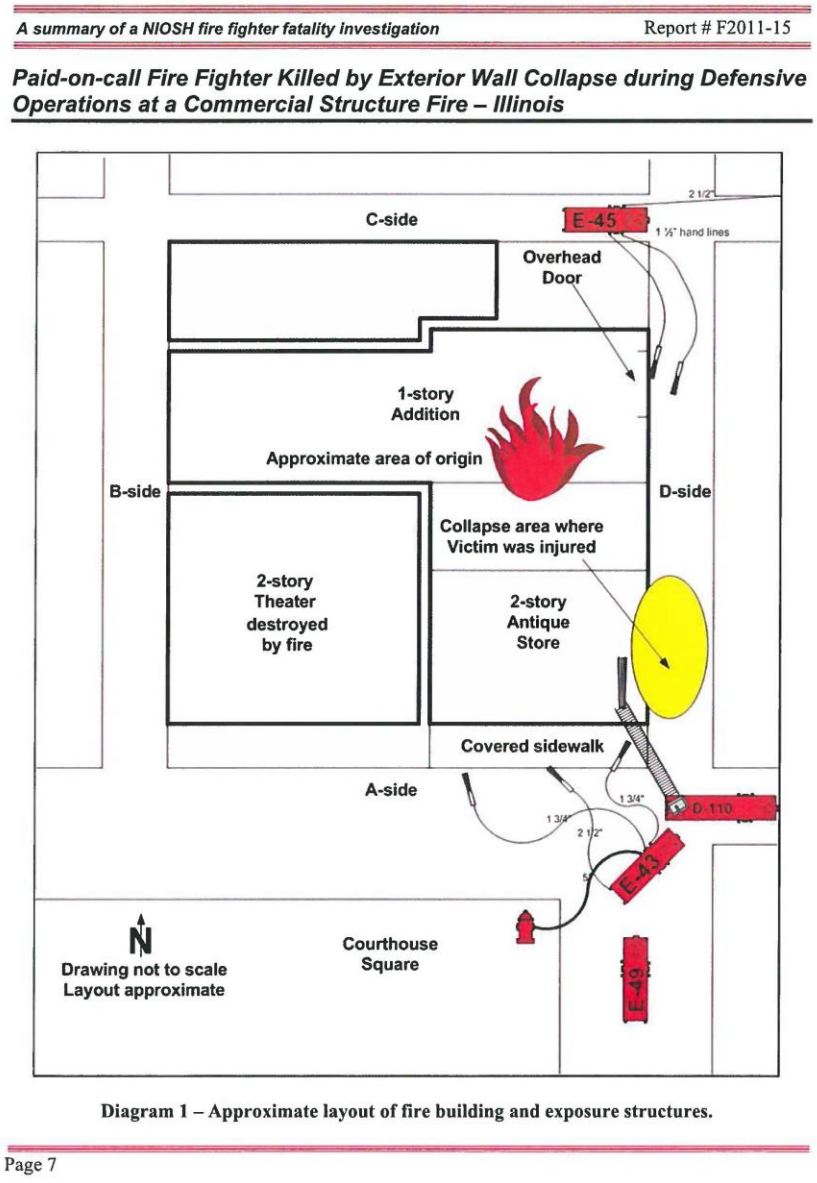
The chief's two bookcases contain not only the minimum set of books required by the insurance rating agency (ISO) but also a variety of recent training and leadership texts. They reinforce his claim to absorb what other fire agencies and fire authors are doing and cherry-pick the best and most applicable ideas for his department. This deflection of credit is consistent with most of the time we spent together- the chief makes it clear that the department members did the heavy lifting of their organizational change up to this point. His air of humility hides the work he has done to create the vision that his firefighters are fulfilling with his guidance. He deftly deflects credit for the department's successful changes onto his peers, mentors, and most significantly the firefighters and officers of the DQFD. He feels that "It's got to be OK for people to challenge what you're doing."

"Reality Came to Town" June 17, 2011

On June 17, 2011, the fire department responded to assist with suppressing a large fire in downtown Pinckneyville, roughly 12 miles northwest of Du Quoin. The fire was located in a 96-year-old brick and masonry building which housed an antique store with living quarters in the rear. The fire began towards the back of the structure shortly after a thunderstorm, with the Pinckneyville Fire Department was notified of the fire at 1515 hours. They called the Du Quoin Fire Department 10 minutes later because Du Quoin had the only ladder truck in the county (NIOSH, 2015). The Du Quoin truck, in use since

2001, responded with four firefighters at 1531 and was joined by two other firefighters traveling in their personal vehicles. The truck arrived shortly afterward (NIOSH).

Figure 4.1: Map of the Fire Scene (NIOSH, 2015)



Officer 3 was the highest ranking and highest-certified firefighter on the scene amongst the firefighters, fire officers, and fire chiefs from multiple surrounding departments. He identified the officer in charge of the fire as "a good guy with no formal training." The fire was being fought defensively, meaning that no firefighters would be allowed inside, due to the congested interior of the structure, advanced fire, age of the building, and because the structure was confirmed to be unoccupied (NIOSH). Officer 3's first actions on the scene were to move firefighters on hand lines farther back from the structure and out from an awning in the front because his experience at the Hurst fire in 1996 and his training led him to believe that a collapse was likely. He then collected the accountability tags from his department's members and turned his back on the fire building to go and record the tags on the board used to track members in his vehicle.

Following their arrival, the Du Quoin crew set up the ladder truck to extinguish the fire from above. The fire grew after the opening of a rear roll-up door on the structure and further intensified as a second-story window was uncovered by a firefighter on a ladder. After opening the second-story window, the firefighter left the ladder in place on the side of the building. The operator of the ladder truck remarked to a chief officer that "your ladder's gonna (sic) burn up." Two firefighters overhead the comment, and took action.

Figure 4.2: The Ladder (NIOSH, 2015)

Paid-on-call Fire Fighter Killed by Exterior Wall Collapse during Defensive Operations at a Commercial Structure Fire – Illinois

Photo 10. Ladder can be seen positioned against the Side D wall before the collapse occurred. Note how smoke is pushing out through the masonry joint at the A/D corner. The smoke obscures a clear view of the exterior wall, possibly hiding cracks and other signs of structural deterioration.
(Photo courtesy of the local newspaper)

At 1554 hours, one Du Quoin and one Pinckneyville firefighter were removing that ladder which was leaning against the side of the building. The Du Quoin firefighter had his back to the building and stood between the building and the ladder, and the Pinckneyville firefighter stood on the far side. While the firefighters had the ladder vertical and off of the building and were preparing to lower the top section, part of the wall that the ladder had been leaning against collapsed. Officer 3 had his back to the building and heard the collapse. "Someone yelled that the wall was coming down. Bricks and falling debris struck the [Du Quoin firefighter] from behind…[The Pinckneyville] firefighter ran perpendicular to the collapsing wall, while the [Du Quoin firefighter] ran parallel to the wall, towards the front of the building. The Du Quoin firefighter was knocked down and partially buried by the falling debris" (NIOSH, 2015, p. 16). Officer 3 turned around and saw many firefighters scurrying towards the rubble. When he saw the black firefighting gear, he knew that the buried firefighter was one of two people, both were from his department, and one was his son. When he "saw the big blue eyes" of his other firefighter digging through the rubble, he was certain that the trapped firefighter was his son.

The injured Du Quoin firefighter was removed from the rubble and transported to the local hospital at 1602 hours and was transferred by helicopter to a trauma center in St. Louis where he died soon after. He was the department's first fatality since it was founded in 1863. An eyewitness from a neighboring business recounted that she "heard the wall collapse. And then we heard a firefighter yell that they needed a stretcher. I seen (sic) them take him out, you never know though how bad it is" (KFVS, 6/20/2011).

The Du Quoin Firefighter that was killed was one month away from completing his probation with the department, and this was his second structure fire. He was the 42nd Line of Duty Death reported to the USFA in 2011 (USFA).

He "died a predictable death, and predictable means preventable." One year later, the local newspaper The Southern Illinoisan described Officer #3 as being "on an absolute mission to make sure firefighters received the training they need." (Stewart, 2012). He was specifically working with the state fire academy to bring more training opportunities to Southern Illinois because funds to travel outside of the area for training were often unavailable. He also collaborated with a local firefighter's organization, the local community college, and the statewide mutual aid network to increase the availability of training.

The incident commander from the Hurst LODD shared that " 'It can't happen here' has now happened here twice."

According to the NIOSH investigation, "The state of Illinois does not have any mandatory state training requirements for volunteer firefighters or fire officers" (NIOSH, 2011). Officer 3 found that in situations such as this where no training is required, 26 percent of departments participate in training. When training is mandated, that rises to 68 percent (Stewart, 2012). Implementing national standards for training was a recommendation of the fatality investigation (NIOSH, 2011), and while efforts have been made locally to improve training, there remains no statewide requirement for training or certification.

A DQFD officer described the feeling as "in 2011 we had a table set and somebody literally yanked the cloth off of it with everything and said start all over again,

everything you've done is wrong and so you have to start over." He continued that "We haven't found our identity [again] yet… we're doing so many new things and a lot of them we did so quickly too, it was like one idea after another after another after another, that sometimes the old one hadn't even taken hold before we were trying to build on top of it."

Chapter 4 Summary

Chapter four provides an overview of the research setting in Du Quoin, Illinois, and a deeper look into some historical aspects of the Du Quoin Fire Department. Three salient episodes that influenced the culture that arose from interviews and other data collection methods were included, as well as the LODD that was perceived as the central cause for the change in this case.

Chapter 5: Findings

This findings chapter provides the changes to the department's organizational culture grouped by the categories which emerged from the process of coding the Modes of Implementation (MOI). Analysis for each MOI grouping opens each section, with supporting evidence from the data obtained in the study. This evidence draws a contrast between Research Question 1: What were the MOI of the DQFD in 2010, and Research Question 2: What were the MOI of the DQFD in 2015? Gagliardi's model is analyzed to see if cultural incrementalism can explain the change that occurred. The chapter closes with a summary.

The researcher and the research project were introduced to the department at a regularly scheduled monthly meeting. The researcher then scheduled observations, document reviews, and later interviews to allow the researcher to build a rapport with the firefighters and officers before conducting interviews. This approach seems to have worked, as during observations and later visits the firefighters spoke conversationally with each other, using nicknames, slang, and coarse and colorful language in the presence of the interviewer, indicating a degree of comfort.

One interviewee described this research project as their first opportunity to talk about the changes that they had been experiencing. While there had been ample opportunity for progressing through stages of grief and recovery from the LODD, they did not appreciate the volume and magnitude of changes to their culture until the interviews and discussions related to this study.

Research Questions

RQ 1: What were the Modes of Implementation of the organizational culture of the fire department in 2010?

RQ 2: What were the Modes of Implementation of the organizational culture of the fire department in 2015?

RQ 3: Did the organizational culture of the department change from 2010 to 2015?

Coding Schema

The Modes of Implementation (MOI) of the department were considered in two broad slices of time, aligned with Research Question 1 (MOI in 2010) and Research Question 2 (MOI in 2015). MOI are the "perceivable forms of behavior and operations," observable expressions of the organizational culture (Gagliardi, 1986, p. 125). Since the goal of the study was to compare two points in time and determine if a change occurred, a focus on the MOI provided more objective results for comparison and analysis.

Following each observation period, interview, or document review, a tool was used to identify the MOI that emerged from each data source. A master list of MOIs was created, and member-checked by the interviewees. The list of MOI that emerged is used to identify points of comparison between the two time periods, broken down by the two time periods in the research questions below. While some MOIs were present in 2015 and not in 2010, there were no MOIs that were present in 2010 but not in 2015. If an MOI is not listed in Research Question 1 (2010) but appeared in Research Question 2 (2015), it indicated that the mode was not brought up during interviews.

Once the full list of MOIs had been member checked, the 27 MOIs were grouped into eight categories. As analysis progressed, this was reduced to 6 overarching categories. These categories and modes are listed in Chart 3.

Table 5.1: Modes of Implementation

Typical Day at the Department General Comments	Correlation to Kunadharaju et al. (2011)
Member Requirements & onboarding (6 MOI)	
- Career O Qualifications	Personnel- Training
- Career FF Qualifications	Personnel- Training
- POC O Qualifications	Personnel- Training
- POC FF Qualifications	Personnel- Training
- POC Participation	Personnel- Training
- Initial Training (Career & Paid on Call)	Personnel- Training
Responses (4 MOI)	
- Accountability System	Incident Command- Accountability
- Fire Responses	Operations- Tactics
- Volunteer Responses	Operations- Tactics
- Medical Responses	Operations- Tactics
External (5 MOI)	
- Compartment Standardization	Equipment- Use
- Interagency Partnerships	Personnel- Staffing
- Automatic Aid	Incident Command- SOPs
- Mutual Aid	Incident Command- SOPs
- ISO	Equipment- Availability; Operations/Tactics- Communications & Personnel- Training
Officer Empowerment (7 MOI)	
- Preplanning	Incident Command- Risk Assessment
- Inspections	Incident Command- Risk Assessment
- Investigations	Incident Command- SOPs
- Fire Prevention/ Public Education	Incident Command- Risk Assessment
- Equipment	Equipment
- NFIRS Reporting	External
- Apparatus	Equipment
Training (4 MOI)	
- Driver Training/Familiarization	Personnel- Training
- Company/Shift Training	Personnel- Training
- Departmental Training	Personnel- Training
- Interagency Training	Personnel- Training

Following the creation of categories, two methods were used to validate the chosen breakdown. First, the 27 MOIs were provided to 3 experienced fire officers and they were asked to group the MOIs into categories. Their grouping correlated with the researcher's categories 75% of the time. Second, the MOIs were considered against the Fishbone diagram of firefighter fatalities (Kunadharaju et al., 2011, p. 1177). All but one of the MOIs listed could be correlated against at least one of the root causes that Kunadharaju listed, indicating that all of the categories had been identified as a contributing factor in firefighter fatalities. By making changes in these areas, the DQFD made changes that could have a positive impact on firefighter safety and injury prevention.

General Information

In 2010, the Du Quoin FD "guys knew we needed to change, knew we were way behind" what other fire departments in the state and US were doing. Change was happening at the Du Quoin Fire Department before the LODD occurred, but it was happening very slowly.

The department had an awareness that the "good ole (sic) boy's ways" wasn't the way forward for the department. They knew that they lacked preplanning, training, and building inspections, especially for unsafe and vacant structures. Staging at emergency scenes was ad hoc, and an accountability system was not in use. There was "a decent grasp of tactics," and the department had an understanding of the OSHA "two in/two out" rule, but it "wasn't routinely followed because enough manpower wasn't always available." They were an "aggressive, interior firefighting department."

Category 1: A Typical Day at the DQFD

Analysis. This fire department averages two emergency calls every three days, and in 2015, their time between calls (termed "excess capacity" in fire service parlance) was much more constructively utilized than in 2010.

Supporting Data. When asked to describe a typical day on the department in 2010, the respondents described a "more laid-back time." They came to work, had a brief discussion with the off-going firefighters which was usually over coffee, checked the apparatus, and waited for a call to come in. Training occurred, but it was monthly and isolated. One officer described the milieu regarding change as "It wasn't necessarily frowned upon to change things, but it certainly wasn't encouraged openly." There were informal conversations about what needed to change compared to other fire departments, but no momentum to make that change happen.

A typical day in 2015 started with a brief discussion between the off-going and on-coming crews. They pass on any relevant information that happened on the last shift and share any items that need to be completed on the new shift in addition to regular activities. Next, the fire apparatus are checked for readiness; then housework is completed. The fire chief typically answers the phone and greets visitors and residents while the on-duty crew is getting their work done.

Once the general work is complete, the crew has responsibilities in their individual areas of responsibility. The crews are now involved in work and projects often lasting until after dinner time, whereas they used to be done with side work for the day in the early afternoon. Training (discussed in more detail later) now has a ubiquitous and permanent presence in the work day.

One officer thought about the question of "what is a typical day like?" and responded that the department is still in flux- "There isn't a 'new' typical day yet. There used to be maddening periods of down time and now there's a lot more scheduled activity." Another member described the current workload as "It seems like now we're always constantly doing something." A third officer characterized the average day as "When stuff popped up in the old days it was no big deal because we had time to take care of it. Now, we're on the go all the time."

An interviewee shared that "There's always something on the burner like a project. Evening time is pretty laid back, but I'll see guys that are still working on something from earlier in the day." He shared that this is a new phenomenon- "In 2010, the workday ended when chores and truck checks were done." Specifically, in 2015 "Everyone is busy with grant funding and writing grants and managing those grants, and everyone in the department has been successful in obtaining a grant" which requires the workday sometimes to extend past dinner into the evening.

The new busier days were described in contrast to 2010, when "the department used to be more relaxed, with members following fewer rules. Now, the department follows more of their stated policies, for example, all members must be properly licensed to drive vehicles, and properly trained to operate them." He shared that the new rules and overall changes were not bad, but different.

An officer described the feeling on "as typical day as we could have in the summer of 2011" as "we had a table set and then somebody literally yanked the cloth off it with everything and said start all over again, everything you've done is wrong, and so you have to start over." He elaborated "We haven't found our identity [again] yet… we're

doing so many new things and a lot of them we did so quickly too, it was like one idea after another after another after another, that sometimes the old one hadn't even taken hold before we were trying to build on top of it."

Category 2: Member Requirements and Onboarding (6 MOI)

Analysis. In 2010, the department had practices in place for onboarding new members, but they were incomplete and irregularly followed. In 2015, there were extensive onboarding requirements for all members, strong promotional requirements, and a renewed emphasis on providing training to new members while developing existing members. The six MOI categories that were noteworthy are qualifications for career officers, career FF, POC officers, POC FF, participation requirements for POC members, and a well-defined process for onboarding new volunteer and career FF.

Supporting Data. In 1983 Officer 3 asked the chief "When will I go to school [to learn how to be a firefighter]?" and the chief replied "OJT," or On-The-Job Training, indicating that the new firefighter would learn all that he needed to know experientially over time. When this officer sought feedback on his performance, he asked "How'm I doing?" which was met with "Is anyone on your ass?" from the previous chief. When he answered "No," the previous chief replied with "Then you're doing OK." His performance was evaluated by conforming to norms more than evaluating his skills and abilities related to desired job performance.

There is a connection between some small career departments in southern Illinois and the Advanced Breathing Apparatus Specialist or "Smoke Divers" program at the University of Illinois Fire Service Institute. This week-long class was utilized by these departments to normalize the various initial training that firefighters had received before

being hired on their current department, and also to ensure familiarity and efficiency with the Self-Contained Breathing Apparatus, or SCBA. A description of the Smoke Diver's program and its connection to the DQFD can be found in Chapter 4.

In 2010 volunteer members attended a 24-hour non-state-certification Illinois Fire College Course called "Basic Recruit Training" for their minimum training, with a goal of attaining their state certification "at some point." This recruit training course is offered once annually over a four-day period three hours north of the department- a formula that put the training out of reach for many members. Other member requirements at the time were not enforced, for example, participation requirements for POC members. "We used to keep guys on the roster until they quit, regardless of whether or not they were active," shared one member. "Now, if you're not showing up and participating regularly, guys kind of select themselves out."

In 2015, a member had to be certified at the basic level of state certification to take scheduled shifts at the FD, with a pay rate of $11 per hour. This was raised from $8.25 in 2014. Persons with advanced FF training are compensated at $12.50 per hour, and those who are certified as fire officers are paid $15.50 per hour. Since state certification is optional in Illinois, it is left up to the individual fire departments to establish these member requirements.

An officer position for volunteers, a lieutenant, was added in March of 2014. Volunteers seeking this position must meet the state fire officer qualifications first; then they can be appointed to lieutenant on the department. A different officer contradicted this statement, identifying the training as encouraged by not required.

In addition to a higher pay rate for responding to emergencies, the department now pays for time spent in training and for time invested in Firefighter certification classes in addition to responses. These activities were previously uncompensated.

For career members, promotional testing for officer positions began in late 2010. Minimum requirements to sit for promotional testing was instituted first for the Chief and Assistant Chief positions and later for all promoted positions. Fire Officer 3 certification was required for the Assistant Chief and Chief, and Fire Officer 2 was required for the rank of Captain.

New members are now sent to the State Fire Academy for an initial training course of 7 weeks. They now exceed all state certification requirements before coming off probation as a full-time or career member.

With the increase in training and improvement in participation due to more training opportunities, volunteer members are around more. This gives them a stronger connection to the department's non-emergency operations. These volunteers must attend 75% of training and meetings. If they do not satisfy this requirement, they receive a notice. Less active volunteers tend to self-select out if they are not attending often enough.

Category 3: Emergency Responses (4 MOI)

Analysis. While the DQFD responded to roughly the same number of emergency calls in 2015 as they had in 2010 (222 calls in 2015, 227 in 2010), they have significantly changed their approach to emergency response and the actions they engage in upon arrival and during fire suppression activities. Notable MOI changes are in the areas of how they respond to structure fires philosophically, how volunteer firefighters respond to

emergencies, the full implementation of an accountability system, and an improvement in how the DQFD responds to medical emergencies.

Supporting Data. Officer 3 identified the department as an "aggressive, interior attack fire department," meaning that the actions taken upon arrival at a structure fire were to don protective clothing and take a hose line into the burning structure. "Unless it was on the ground, we went in." He and other interviewees trace this Mode of Implementation back to the first common class that all newly-hired full-time members participated in- the Advanced Breathing Apparatus Training, known commonly as "Smoke Divers." This aggressive style led to committing firefighters to burning structures without an adequate size-up, and without an exterior firefighter rescue team. Emphasis used to be on "run and gun," on being quick to get water on the fire without considering all of the variables related to safety. "It was chaotic, but we thought we were doing a good job."

Full-time staff each drove an apparatus to the scene, and volunteers met the apparatus at the scene. When subsequent members arrived at the scene, they looked for other members that were working and found some way to help. "You arrived on scene and looked for something to do," is how one firefighter described the ad hoc nature of assembling teams. He continued, "We were a very aggressive interior firefighting crew. Our 'business as usual' was to knock it hard then we're thinking about water [supply] second to our initial attack."

The current practice for responding is to have the volunteers respond to the station unless their route to the station takes them directly past the emergency scene, enabling the department to begin tracking members at the station and continue it at the scene.

While some leaders describe this new process of having volunteers responding to the station instead of directly to the scene as happening "every time," others characterize it as a change that is still in progress. There's a tension here- one officer shared that while he appreciates the need to keep personal vehicles from cluttering up the scene and the need for increased accountability, he felt "that has to be balanced with the need to quickly get bodies on the scene to get to work."

In 2015 "one of the things that is much better is performing and communicating a size-up. The fireground is set up more intentionally, and people are assigned to tasks as part of an overall strategy by the Incident Commander instead of looking for ways to help." This increase in developing a plan for fire suppression was described in the context of increasing firefighter safety through the comment that the "Pendulum of FF Safety has swung to the far right here and around the area. Now persons respond to the station and don't go directly to the scene in their private vehicles. There's an emphasis on getting the third piece of apparatus staffed and on the scene, instead of getting firefighters in their private vehicles to the scene." Because all members now have a pager to alert them of emergencies in the community, more members are showing up for calls.

As a component of the incident command system, an accountability system, a means for tracking which firefighters were engaged in which tasks, was emerging on the department in 2010, being utilized at the scene of the LODD in 2011, and is now in consistent usage. It was one of the first changes initiated in May 2010 when the new chief took office.

The accountability system implementation, going from no system to changing the organizational culture to using the system at every emergency was one level of this

change, but a deeper commitment to keeping track of each firefighter came through in the interviews with the statement "Accountability isn't simply putting a name or a tag on an organizational board or tool. It's evident in how firefighters communicate on the scene. Tasks on the fireground are assigned from a central position by the Incident Commander as units arrive, replacing the formative approach used previously where individual firefighters determined their work assignments." This was corroborated by four other members with the statements "Now we track who is on the scene, and where they are at the incident," and "There's now a central hub of accountability." While the system is always engaged at the start of an incident, one member shared that "The department is still learning how to maintain accountability on the fireground," meaning that as an incident evolves members may switch partners or assignments, and the change is not always reported back to the Incident Commander.

Responses to fires are now much more organized after the accountability system is implemented. "Individuals form up as crews and work as a group under the direction of an officer who is operating in contact with the incident commander." This is enhanced through communication because "Everyone on the scene has a portable radio now, and radio communications are better structured following [a class delivered at the department by IFSI in August of 2011] called Fireground Management for Small Career and Volunteer Fire Departments." This class was delivered to the DQFD as the department was still reeling from the LODD, and early in the change process. It provides a simple system for communicating and prioritizing activities on the fireground and "It laid the groundwork for future classes to build upon by creating a command structure, divisions of labor, and radio communications discipline."

A challenge of the increased workload is reflected on by two officers who separately shared that it was "Very difficult to be 100% of the command staff and 50% of the on-duty staff," meaning that with two members on duty, they had both be in charge at the fire but also work on tasks related to fire suppression.

Another change came with the "Realization that we shouldn't measure our guys on 'that guy did four bottles, he's a real firefighter!' We are now managing our people effectively like 'you did two bottles, you need to go sit down and you're done for a long time, maybe you're not coming back [to service at this fire].' " Rehabilitation is now an integrated part of fireground operations. "In the past you'd come out, grab a bottle of water, maybe not take their coats off, turn around five minutes and go back in." Another member described the prior practice to determine medical needs on the fireground as "The only time you'd see the medics is if you actually needed to go to the hospital." Members are now assessed at regular intervals before returning into the burning structure.

Another significant are of change on the fire ground was referred to by members as "Second line discipline." From 1996-2011 it was rare for this department to pull a second hose line to reinforce the first, and rare for the department to secure a water supply as a part of their initial operations. Now, "pulling a larger line (2-1/2") is common, and pulling a second line is also more common."

Medical Responses are now at the First Responder level, where previously the members had no consistent, formal training for responding to medical emergencies. Now they respond along with the ambulance that is stationed in town, and if they arrive before the ambulance, they can begin care within their scope of practice.

Category 4: External Relationships (6 MOI)

Analysis. The department has drastically transformed their relationships with neighboring agencies and also improved their fire suppression rating with the Insurance Services Office (ISO). Changes related to other agencies in addition to this ISO change relate to interagency partnerships and interagency training, standardizing compartments on apparatus across the geographic area, and changes to automatic aid and mutual aid response.

Supporting Data. ISO provides a numerical rating to fire departments for purposes of determining the cost of fire insurance to residents of that department's protection area. Departments are scored from 1 (best possible fire protection) through 10 (no recognized fire protection). There are minor differences in rates amongst ratings 1, 2, and 3; likewise, a rating of 4, 5, or 6 is slightly different. A rating jump from a 4 to a 3 or a 7 to a 6 represents a more dramatic improvement in protection and a more dramatic decrease in insurance premiums.

The ISO evaluates departments on three main areas: Communications, Water Supply, and Training. The former two categories are generally out of the department's control, but the latter category is a target rich environment for improvement. In 2010, the DQFD was ranked as 7. The department is now ranked as "a solid 4," meaning that a third-party agency recognized significant changes in how the department trains and their capabilities to respond to emergencies, lowering fire insurance costs for Du Quoin residents. A discussion of the specific training changes occurs later in this chapter.

Compartments on fire apparatus are now standardized within the DQFD and also with many of their mutual aid departments. This consistency allows firefighters to be

familiar with the layout of equipment on other agency's apparatus, allowing for easier retrieval of tools during emergencies.

Both the department studied in this case and the neighboring department where the fatality occurred "reported that they planned to implement mutual aid training with neighboring departments but had done so on a limited basis" before the LODD (NIOSH, 2011). In 2015, this intergroup training was "More structured and more prevalent." Recent topics with other agencies include fighting propane tank fires, confined space rescue training, and grain bin emergencies. This training allows DQFD members to "both meet and assess members of other departments. These assessments can influence the level of trust between members of different departments at later incidents." Training is now viewed as a networking experience, not something mandatory that had to be endured.

A specific area of training was in a course from the State Fire Academy on the five combat positions of fireground leadership. This course focused on the responsibilities of 5 critical fireground leadership positions- Incident Commander, Operations, RIT, Planning, and Safety Officer. The IC position is filled first, then Ops, then RIT, then Plans, then Safety. The IC carries all positions until there is sufficient personnel present to delegate to. This is incorporated into all training and responses and has become a part of the department's routine actions. One officer characterized the pervasive nature of this thought process as "Even newer members with no command responsibilities are aware of the positions, order they are filled, and what the positions entail," even if they aren't qualified to fill them yet. This program also led to the development of local and regional protocols for responding to downed firefighters.

Another area that differs in 2015 from 2010 is in the areas of how the DQFD requests help from other fire departments. There are two different systems- Mutual Aid, where a department manually calls for assistance or resources from neighboring agencies, and Automatic Aid, where additional resources are sent based upon information received at the dispatch center. A system of planned responses called Box Alarms has been created, so that responses are planned in advance, and more assistance and resources can be brought to bear faster by the Incident Commander at an emergency.

When neighboring departments arrive to work with the DQFD, they are now fully dressed in their PPE and ready to "go to work." The Chief relates that one of the neighboring fire departments that stood by at the Du Quoin fire station while the DQFD was out on alarms previously requested to be able to come to the scene to standby so that they could watch how the department operated and learn from their example. This department used to arrive not fully dressed in PPE, without SCBA, and without tools. Now, when they show up they are fully dressed in their gear, wearing SCBA, with tools, and ready to go to work. The Chief summed up this transformation as "They bought in."

A neighboring fire chief described that the DQFD LODD "brought other chiefs closer to [the Du Quoin Chief]," and it "opened the door for departments to train together more." The DQFD chief was described by a chief from outside of the department as "the center of gravity, creating a slow, generational move towards making quality training a priority" in their region in Southern Illinois. Over the radio, this chief can hear the DQFD "calling for mutual aid sooner, and performing a thorough and consistent description of the situation when they arrive on the scene." This maintenance of the change in the department is reinforced by the fire chief continually "preaching the word."

"Thanks to [the Du Quoin Chief] him there are more volunteer fire departments training with career departments."

Other interviewees asserted that the DQFD and surrounding departments have been "so busy changing, they didn't realize what they'd changed." These additional changes in the training environment include a new Fire Science Program at the Rend Lake Community College, area-wide policies and procedures for responding to firefighters in distress ("MAYDAY" events), and the creation of a new response division based on geographic proximity instead of political boundaries. A social group that engages in training while preserving firefighting traditions was also formed, providing another dimension to the inter-group relationships.

Category 5: Officer Empowerment (7 MOI)

Analysis. The most significant changes to the DQFD's organizational culture are rooted in changes to the responsibilities and empowerment of the full-time officers, the full-time firefighters, and the volunteer officers. Seven MOI were tied back to this activity, with an additional 5 relating solely to training in the next section. The areas of responsibility that the full-time staff were empowered to influence are preplanning, inspections, investigations, fire prevention & public education, equipment, NFIRS reporting, and apparatus maintenance.

Supporting Data. Each full-time member now has a secondary duty on the department. These duties are assigned by position on the department, and as individuals move up in rank and tenure, they take on a new role. The Chief's stated intention is that by the time a person has moved into the assistant chief position, "he has been in each of the subordinate positions and tasks and is in a more well-rounded position to lead."

As part of this officer development and empowerment, "All full-time staff have written and been awarded a grant." The process of obtaining the grant allows members to network with other city employees and to learn to research how to complete grant applications. It also allows the employees to interact with the city council to obtain matching funds for the grants, and better understand the process involved in obtaining outside funding. Recent grants total nearly $500,000.00 over the past ten years, with the two largest grants ($217,636.00 and $47,239.00) being received in 2013 and 2014 respectively.

Preplanning, or studying specific buildings and hazard areas and planning a response before an emergency exists, is now done extensively. More than "75% of downtown has been preplanned" as of 2015 when no preplans existed in 2010. This responsibility was just shifted with a retirement of the previous Assistant Chief in the spring of 2015. The increase in preplanning has led to "Greater recognition and discussion of hazards in the community."

Fire investigations were previously completed by persons without formal training or referred to the Office of the State Fire Marshal in 2010. In 2011, the officer tasked with leading the investigation program "Took three weeks of Fire Investigator training and began conducting fire investigations as soon as I was certified."

The area of equipment inspection and replacement is relatively unchanged from a process standpoint, but it was transferred to a new member due to a retirement and promotion. There have been minimal changes to the NFIRS reporting program and the practices for testing apparatus and maintenance because the department was and is performing adequately in these areas.

Prevention and Public Education have recently been assigned to an officer. One of the first events was to purchase glow sticks for all kids participating in trick-or-treating in October of 2015. While no funding existed, the DQFD members "All chipped in personal monies to create a fund to buy the [glow sticks]."

Building inspections are the newest area being developed, but while nascent they are very active. Inspections "Started in 2013 when the city adopted newer building and fire codes" combined with an officer attending training in building inspections. Inspections did not exist before that.

Category 6: Training (4 MOI)

Analysis. Training activities are now ubiquitous to the routine of being a Du Quoin Firefighter. It occurs during the day in and out of the station, with career and volunteer members alike, and now includes programs taught by outside agencies and inclusive of other departments in the area. While the idea of increasing training within the department was part of the chief's original vision, the breadth and scope of the training changes warrant a stand-alone category from the other changes that resulted from empowering officers.

Supporting Data. All full-time firefighters are now sent to the State Fire Academy for seven weeks of intensive initial training, even if they are already certified to the initial level. To stress the importance of this training as a rite of passage, All but one of the off-duty FF traveled the three hours to Champaign for the new FFs graduation.

A new weekly training program is the Driver Training/Familiarization program. The officer who coordinates this training gives several addressed to each shift. Members then practice response routes, identify water sources, and discuss tactics with the other FF

on duty that day. This MOI has already evolved to where this information was originally kept between the two on-duty firefighters, but it is now shared department-wide. An officer shared the importance of this broader sharing by stating that "This has led to more practice communicating a size-up of the fireground," giving the members an opportunity to practice and reinforce communication and incident management skills.

This training that happens at the shift and company level has "Increased across the board," "Is now a daily occurrence, and is "at a higher level" as the department grows more comfortable with and sees the benefits of the new training regimen.

Departmental Training is now "more thorough and consistent." It is still held monthly, but "attendance is improving over time as more people are buying into the need to train." According to a local training officer, the previous chief limited "the training that was available to the department, even when the training was at no cost to the department." Now the department takes advantage of "as many classes as we can" through a variety of venues and presenters.

Research Question 3: Did the organizational culture of the department change from 2010 to 2015?

Analysis. The organizational culture of the department changed significantly from 2010 to 2015. Originally it was expected that the change was driven by the 2011 LODD, but as a result of interviews, document reviews, and observations the researcher learned that the leadership change to a new fire chief in the middle of 2010 had a defining impact. The LODD impacted the resources that were available and provided motivation for the department to change.

Two major sources of the changes in this case study- first, changes that were initiated by the chief almost immediately upon his promotion to that position in 2011, and those that originated as second-order changes once the chief empowered the full-time firefighters and officers with new responsibilities. The initial Chief-initiated changes empowered members with new responsibilities. These members then moved forward on developing with their new responsibilities, leading to the second round of major changes.

Schein and Gagliardi both describe a connection between organizational culture and the leaders in that culture (Schein, 2004; Gagliardi, 1986). In this case, the initial changes were instituted by the new fire chief and the secondary changes were created through his subordinate leaders in the department.

Supporting Data. One officer describes the changed organizational culture as "we're doing driver's training during the day, we're doing preplans, we're doing inspections, we're going out and giving tours and doing this and doing that- we're doing so much more but at the same time we're doing it with less." His comments reflect the tension inherent in change as significant as what the DQFD has processed. This frenetic pace was driven by the chief who said that after the LODD he "wouldn't take no for an answer for the changes that I felt needed to happen to this department." He maintained a rapid cadence of change because in a different fatality he was familiar with, the department "lost steam while making necessary changes, and all issues weren't addressed."

Along with an uptick in activity, there are more "struggles with communication." This description was provided by a senior officer of the DQFD without hesitation when in response to the question "if you were chief for a day, what you change?" He indicated

that the communication is necessary to reinforce the changes, and to keep all three shifts abreast of changes made on each shift. Communication was an area of challenge identified by 4 of the internal interviewees. The issue was described as "organization-wide, not tied to a particular person." Another identified that the "rate of change drives the communication challenges," and a third narrowed the issue down to relaying information as biggest weakness, compounded by a frenetic rate of change. One member connected the communication challenges and the rate of change by saying "We're learning and passing on what we've learned before we've mastered it." Compounding this hurdle is a lack of stability due to constant change- "Everyone is focused on their side responsibility, and it creates knowledge gaps because of limited communication."

While issues arise from time to time, a firefighter shared that there is a uniform "Focus on going forward, not backward."

DQFD Members are now paying attention to research by national agencies such as UL and NIST. They are "seeking to stay abreast of new developments in fire behavior, ventilation, exterior fire attack." This cutting-edge mentality is evidenced by one member's comment "When you can go to FDIC, the world's (sic) largest fire expo, and you can hear keynote speakers presenting on information you've already heard about in our small town in Illinois because of contacts our Chief has made and technology that's now available to learn on our own."

Another change shared by the members is that the "Chief has created a culture where it's OK to question things off the emergency scene." For example at one fire the chief failed to set up a Rapid Intervention Team (Firefighter Rescue Team or RIT), and another officer asked about it in the station. The chief thanked the officer for asking, and shared

that he had gotten busy and forgot to establish one early into the incident. Under the previous chief, questioning fireground tactics was not acceptable.

The chief vowed to the members that he "was going to send us home after every call. That's when he started this regimen of not just necessary training, but pretty much state mandated training and there was a lot of that we hadn't been doing. So he broke out the books and figured out exactly what he had to be doing as a department, especially as far as training hours and as far as what we needed to be training on and what we didn't need to be training on. Our Chief has done a really good job of leading us into the right direction."

Not all members felt that all changes were necessary. One shared that "Some of the change was needed, some of the change was for the sake of change I think…Some of it wasn't a smooth transition…I think we're still working on it."

A specific change in how members relate to one another was commonly expressed. One officer described "a cultural change of valuing members more, mentoring more, looking out for each other more." Another reinforced that sentiment with the comment that "We're looking after our guys better, every hour, every day, every call." A third shared "We value ourselves more than we ever have. We didn't consider ourselves disposable items, but now we're not going to risk a guy for something we really shouldn't be doing" (O#12). A different member described this new milieu as having "more ownership" but "now we know better, but still lack some of the resources we need."

A unique response offered by a member when asked what was different was "It would be easier to tell you the things we're doing the same than to tell you what we're doing differently. We knew that we needed more training and we needed more stuff but

we were always told that there was no money. Guys asked to go to classes but there was no money to send them. After the NIOSH report came out the city asked: 'what do you need?' " This latter comment reinforces that the LODD was more of a catalyst than a cause of the change.

In addition to the changes reported by the members, during the researcher's time with the department he was a witness to several changes in MOIs, including new SCBA, new rescue tools being put into service and the old tools being donated to a needy neighboring department, and improvement of the home-made exhaust removal system to a commercial system, to exhaust the diesel soot from the apparatus directly from the vehicles to the outside.

Applying Gagliardi's Model.

Cultural Incrementalism can account for the changes in the department from 2010-2015. The two phases of change, chief- and subordinate leader-initiated, complement the idea of cultural incrementalism by spreading the changes out to different members at different times. They also built in an empowerment to the members of the organizational culture which created buy-in from those members. Unique to this case was the LODD of a member as these changes were occurring, making it difficult for members to push back against the changes to the organizational culture.

There are also indications that change occurred at deeper levels of the model within this department. The lines on the graphic for culture are finite, but in reality there is some fluidity between the levels. The openness of communication between members at different levels the hierarchy and the alignment between desired and stated expectations suggest changes within the secondary strategies. The Primary Strategy

appears to have been impacted, as these changes were implemented over a 5 year period and remained in existence at the time of the study. This study was not focused on the deeper levels of the model, but further research could confirm that these changes truly occurred.

Chapter 5 Summary

While the assumption was that the LODD drove the change, the study revealed that the Chief had initiated changed before the LODD that were nascent but developing. The LODD caused resources to be available, for the department leaders to be more motivated and less resistant to change, and for the Chief to remain deeply passionate about the changes he needed to make. There were first- and second-order changes on the department, the former driven by the Chief and the latter driven by the full-time staff and department officers.

The two time periods selected were accurate to capture the change without infringing too closely on the LODD itself. The MOI were an appropriate measure to suggest which changes occurred by generating sufficient data to answer the research questions and reach a conclusion, and also to provide a glimpse into why the change occurred.

While this study drew a comparison of changes between two distinct points in time, the bigger vision of the fire chief is captured in his statement "We're still not done changing."

Chapter 6: Conclusions, Implications, Future Research

This study looked at a fire department that had an organizational cultural change between the years of 2010 and 2015. Change did occur, and there is evidence to support that it was due to practice changes implemented by the fire chief following his promotion in 2010 and the subsequent empowerment of the other officers and full-time department members. A Line of Duty Death occurred in 2011, and while it was initially viewed as the reason for the change, it is more accurate to characterize the LODD as a motivator and driver for change that was already part of the new Fire Chief's vision.

Chapter 1 provided an overview of the study. It shared that while the number of fires in the US has decreased, and the number of civilians killed by fire has decreased, and that the technology available to firefighters for increased safety has increased, the number of firefighters killed in the line of duty has held steady. Three research questions were offered to establish time boundaries for the studies and define the unit of measure used within the time frames for comparison.

Chapter 2 situated the problem in the HRD and Firefighting literature, showing that the fire service has a deeply-rooted culture, and shared that national firefighting organization were attributing LODDs to this organizational culture. A review of culture, organizational culture, and some aspects of the fire service organizational culture were offered. For purposes of this paper, fire service organizational culture was defined as the values, assumptions, beliefs, observable traits, expressed rationales, strategies, stories, heroes, and traditions of a group of fire service members at a specific bounded level.

Chapter 3 proposed a research plan of a single, instrumental case study of one fire department and detailed the criteria and process for case selection. The research plan

addressed looking specifically at two time periods that were compared using Pasquale Gagliardi's model for the creation and change of organizational cultures. A detailed description of how data would be collected and triangulated was offered.

Chapter 4 shared the selected setting for the study. It described the community, a historical view of the fire department, three mini-case studies of events that impacted the fire department's organizational culture, and concluded with a description of the events surrounding the LODD.

Chapter 5 provided the findings of the study. The findings were coded using themes that emerged from the analysis of interview, document review, and observational data. The data were compared between 2010 and 2015, with 28 data points in 6 categories demonstrating that change had occurred. These MOI and themes can serve as the basis for additional study as recommended below.

The preliminary hypothesis based on initial screening that the department existed a certain way in 2010, they experienced an LODD, changed their organizational culture as a result, and were a changed department in 2015. What the study revealed was that the promotion of a new fire chief with a strong vision in April of 2010 started the winds of change at the department, and the department was primed and ready to unfreeze and accept some changes as the result of the leadership transition. The LODD served to catalyze and reinforce the changes that the Chief had started to institute in 2010, and these initial changes created a set of new positions and responsibilities for members. As these members grew into and fulfilled the chief's vision for these new positions, a second wave of change occurred, led by the subordinate members of the department as they developed their new responsibilities.

Conclusions

There was a change to the department's organizational culture between 2010 and 2015. Many aspects of the first wave of organizational culture change can be directly tied back to the leadership change that occurred in April of 2010 when a new fire chief was promoted. There was strong influence from the LODD that took place in 2011 in the form of resources and motivation as well as reinforcing what many members of the department already new- the department needed to look critically at their agency and develop a plan to improve. While the change was in progress when the LODD occurred, one member described the fugue in the months immediately following the event as "Things got worse before they got better" because the chief was off work for several months following the LODD, and the Assistant Chief filled in for him. At the same time, the department struggled to make sense of the LODD and reorient them to a new reality.

The second wave of change was led by subordinate leaders in the fire department as a result of being empowered with new responsibilities by the fire chief. These new responsibilities made each subordinate leader a change agent in a particular area, and with the support of the fire chief each area of responsibility saw growth, expanded functionality, and overall increased effectiveness.

The outermost level of Gagliardi's Model for the Creation and Change of Organizational Cultures, Modes of Implementation, and the concept of Cultural Incrementalism does account for the changes that occurred to the Du Quoin Fire Department. The phased nature of the implementation of the changes in two waves, first by the chief, and later by the department leadership unintentionally applied cultural incrementalism to lead changes.

An example of this change is the expressive strategy that was modified from "we go in" to "we go in if the benefits are greater than the risks." This quote is an example of the successful implementation of Gagliardi's concept of cultural incrementalism in this case study. This quote also indicates that there are likely changes deeper than the level of Modes of Implementation, creating an area for additional study.

Chief Dennis Compton's definition for the organizational culture of a fire department was utilized. It includes "all the behaviors, ideas, attitudes, and values shared by a group" of firefighters which is transmitted to current, new, and future members of the group (Compton, 2010). The comparison and analysis of the Modes of Implementation in this study support the observable components of this definition, and validate the behavior portion of this definition for use in future studies.

Implications for HRD

This study adds to the HRD literature by exploring the role of the organizational leadership in successful change implementation, identifying a level of analysis (MOIs) that appear valid for measuring cultural change within an organization with a deeply-rooted culture, and reinvigorates Gagliardi's Model for the Creation and Change of Organizational Cultures as a tool for measuring cultural change.

This study was conducted at the level of Modes of Implementation, or observable behaviors, in a strong culture. This level of analysis provided rich data for comparison, generating 28 specific modes that were compared. Similar modes can be identified within non-fire service organizations leading to similar comparisons in other organizations with stronger cultures, and in those with weaker cultures.

Since the model was applied in a deeply-rooted culture, the model should also hold true for less deeply-rooted cultures. HRD practitioners can apply this model outside of emergency services in general situations where an organization needs to institute a change in organizational culture.

This study also fills a gap in the literature on cultural change in emergency services organizations and other organizations with deeply-rooted cultures. Law enforcement agencies, emergency medical services, dispatch agencies, and military agencies can also benefit from this study and leverage Gagliardi's model for cultural change needs in their organizations. While additional research is necessary to validate the study within each industry, these groups have also been noted to have change-resistant and robust cultures, and the model could be tested in those milieus.

HRD theory is also advanced, because this is only the second scientific study of an organization that experienced a cultural change subsequent to an on-duty death. Of an even greater contribution to the theoretical knowledge base is the resulting discovery in this study that the change resulted from the role of leadership as well as the death, which allows the model to be applied to other organizational cultures for change without the aspect of a fatality.

This model is also available for HRD practitioners who are engaged in changing organizational culture, understanding how to lead a successful culture change, and how to categorize levels of culture in need of change. It also provides a framework for planning and enacting strategic change in an organization.

Implications for Fire Departments

This study supports that cultural change can occur in a fire department and that Gagliardi's concept of cultural incrementalism can be used to assess current MOIs and set goals for future MOIs. MOIs can then be implemented gradually as part of a strategic plan to change or modify certain aspects of the organizational culture. It also offers a partial validation of a definition of some components of fire department organizational culture, opening the door for future explorations that seek to better identify the components that are present in fire departments that contribute to the organizational culture.

The DQFD implemented the various MOI changes at different times. While there was a plan in place from the Fire Chief, when he took a leave of absence following the LODD, there was a period of discontinuity of progression for the changes. Some MOI changes drove others, and that order should be considered in agencies that are seeking to make changes in one of the same or similar areas.

The most important change was in the area of Officer Empowerment. By establishing these MOIs first a vision is established, along with a foundation for the next two areas, Member Requirements/Onboarding and Training. New members were onboarded within the new vision of more distributed leadership and under established member requirements for promotion and advancement. The MOI changes seen in the Typical Day, Emergency Responses, and External Relationship flow through from the broader strategies implemented by the newly-empowered officers through an enhanced and coordinated training program.

This study reinforces David Griffin's statement that "strategic leadership is important following [Fire Department LODDs]" (Griffin, 2013, p. 213). Griffin analyzed

the changes within the Charleston, South Carolina Fire Department following multiple LODDs in 2009. This study validates the use of Gagliardi's model for the study, planning, and execution of changes at the MOI level within a fire service organization.

This study also supports Edgar Schein's comment that "The only thing of real importance that leaders do is to create and manage culture" (Schein, 2014). In this case, there were two waves of leadership, first from the fire chief's direct actions, and the second wave from empowered staff members. The LODD occurred between these two waves of implementation, and changes were in progress on the culture when the LODD occurred. This provides evidence that change can be planned and executed in a deeply-rooted culture outside of the LODD milieu.

Implications for the Fire Service as a Whole

In addition to the single organization- and department-level applications listed above, this study can be utilized to build training programs that can be shared with agencies in emergency services. Fire departments and other agencies can be trained to identify the need for cultural change, identify the current state of the organization, plan the change, and then implement and measure the change as it progresses. This could be broadened to include any agency with a deeply-rooted culture that has a need for organizational culture change.

These trainings could be included in programs at a macro level at national conferences and the National Fire Academy, delivered through State Fire Training Academies, and locally at larger metropolitan departments and departments throughout the fire service. How to identify cultural components and enact change at the unit or

department level can also be incorporated into national standards, and made a part of the training for officers and leaders across the fire service.

Applicability of this Study to other Agencies

Four indicators of quality for data collected for qualitative research were applied in this study, based upon the work of Lincoln and Guba (1985). The four measures are Credibility, Transferability, Dependability, and Confirmability. Adherence to these measures created a study that has greater potential to be utilized or compared to other situations.

Credibility was validated by having members who participated in the study review results and conclusions. Following this internal check, persons familiar with the case but outside the department reviewed the findings and validated that the findings to provide outside credibility.

Transferability ensures external validity. As discussed in the Chapter 3, there are inherent limitations to a qualitative study like this case study. The case was described in detail so that another fire department could be matched against this one for potential comparisons. However, drawing comparisons to other fire departments must be done cautiously and only where there are allegories between the two agencies.

Dependability ensures that the questions, methods, and data are matched for the case. The greatest assurance of this was provided through the Dissertation Committee who reviewed all aspects of the project before it began, and who served as a resource during the data collection and analysis. This study was also compared to a similar study by Dr. David Griffin, which allowed some structural comparisons between aspects of the study where they were similar to his study.

Finally, confirmability or objectivity was ensured by keeping detailed records of the study as it progressed, including original transcripts, interim records as the analysis and coding began, and triangulation of methods and data by the dissertation committee. As previously mentioned, the study focused on observation-based Modes of Implementation.

Limitations

This study focused on the two time periods but did not specifically ask about the events immediately surrounding the June 2011 LODD. There might be a greater impact on the study from the LODD than is revealed and discussed in this study because the topic was avoided because of the sensitive nature unless individuals initiated the discussion during their interviews. While the LODD was originally viewed as the reason for the change, the fire chief's leadership played a larger role. The tragedy reinforced the changes that the fire chief laid out in his vision and helped to garner allies and change agents in the DQFD and across the region.

Recommendations for Future Research

Future research opportunities include:

- Follow up with this agency at a future time and reassess how much of the change has been made permanent, and which new MOIs could be identified. As one member stated, "We're not done changing."
- Repeat the study in a department that wishes to see a change in their organizational culture, and conduct a prospective study.
- Repeat the MOI comparison study in a department that underwent a reorganization or other major change, but without an LODD.

- Repeat the study in a department that experienced an LODD, but without a top-down change occurring at the same time.
- Apply Gagliardi's Model for the Creation and Change of Organizational Cultures to a department seeking a change to a safety culture.
- Repeat the study with a focus on a deeper level of Gagliardi's model, for example, one of the Secondary Strategies.
- Explore the impact of the Smoke Diver's program on other classes in the area.

Concluding Thoughts

Using the Modes of Implementation from Pasquale Gagliardi's Model for the Creation and Change of Organizational Culture generated sufficient data from the two time periods to determine that a change to the DQFD's organizational culture did indeed occur. The case study method allowed the researcher to understand that the observed and stated changes occurred following the LODD, but many had their origins to changes enacted by the fire chief before the death.

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Appendix A: Institutional Review Board Approval

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Vice Chancellor for Research

Office for the Protection of Research Subjects
528 East Green Street
Suite 203
Champaign, IL 61820

February 20, 2015

Brian Brauer
Fire Service Institute
Il Fire Service Inst
2218 E University Ave
Urbana, IL 61802

RE: *Changing Fire Department Organizational Culture: A Case Study Following a Line of Duty Death*
IRB Protocol Number: 15540

Dear Dr. Brauer:

This letter authorizes the use of human subjects in your project entitled *Changing Fire Department Organizational Culture: A Case Study Following a Line of Duty Death*. The University of Illinois at Urbana-Champaign Institutional Review Board (IRB) approved, by expedited review, the protocol as described in your IRB-1 application. The expiration date for this protocol, IRB number 15540, is 02/18/2016. The risk designation applied to your project is *no more than minimal risk*. Certification of approval is available upon request.

Copies of the attached date-stamped consent form(s) must be used in obtaining informed consent. If there is a need to revise or alter the consent form(s), please submit the revised form(s) for IRB review, approval, and date-stamping prior to use.

Under applicable regulations, no changes to procedures involving human subjects may be made without prior IRB review and approval. The regulations also require that you promptly notify the IRB of any problems involving human subjects, including unanticipated side effects, adverse reactions, and any injuries or complications that arise during the project.

If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me at the OPRS office, or visit our Web site at http://www.irb.illinois.edu.

Sincerely,

Ronald A Rutz (for Anita Balgopal)

Anita Balgopal, PhD
Director, Office for the Protection of Research Subjects

Attachment(s)

Appendix B: Oral Survey Statement

"Thank you for the opportunity to interview you for my dissertation. I am a doctoral student at the University Of Illinois College Of Education, and this research is being overseen by my advisor, Dr. Peter Kuchinke.

The case study I am conducting will ask you questions about your experiences in the department in 2010 and 2015. I am interested in learning about how your department is different between the two time periods.

This study is approved by the University of Illinois Institutional Review Board.

(Review IRB information on the consent form with the interviewee).

Interviews will be kept confidential. You will be identified as "FF" or Officer and a random number.

After you read and sign the consent form, I will answer any questions before beginning the interview.

Appendix C: Participant Consent

Case Study Informed Consent

1 March 2015

My name is Brian Brauer, and I am a student in the College of Education at the University of Illinois. I am conducting a case study under the supervision of Dr. Peter Kuchinke as a requirement for my dissertation, and am asking for your help with this study.

You are invited to participate in this research project, which will develop a description of the fire company that you are a part of, looking specifically at how the department is different now than prior to the fire on June 17, 2011. I am specifically interested in the environment of the station, how the people, places, and things interact to make up your fire company before and after that date.

I will be visiting the fire station to observe how you work over two shift days, asking questions throughout the day, and making notes about these observations. I will also be conducting one-on-one interviews with the members of the company who choose to participate. These interviews will last for approximately 45-60 minutes, and will discuss your experiences as a firefighter and as a member of this fire company before and/or after the 6/17/2011 fire. Lastly, I will be obtaining some governing and historical documents. All of this data will be kept secure, and accessible only to Dr. Kuchinke and I. The audiotapes will be transcribed and coded to remove individuals' names and will be erased after the project is completed.

In the final report, neither you nor your company will be specifically identified. You will be referred to as a member of the DuQuoin fire department. It is your choice whether or not you will be interviewed. My goal is to interview the entire fire department.

We do not anticipate any risk to this study greater than normal life and we anticipate that the results will increase our understanding of how fire companies operate, and how change occurred in your fire department. The results of this study will be used for a dissertation, a scholarly report, a journal article, and conference presentation. In any publication or public presentation pseudonyms will be substituted for any identifying information.

There is little research that looks at how fire departments change, and this study could help identify one model that leads to successful change.

Your participation in this project is completely voluntary, and you are free to withdraw at any time and for any reason without penalty. Your choice to participate or not will not impact your job or status. You are also free to refuse to answer any questions you do not wish to answer. There is neither an incentive for participating, nor any punitive action if you choose not to.

If you have any questions about this research project, please contact Brian by telephone at 217-333-9027 or by e-mail at brbrauer@illinois.edu, or contact Dr. Kuchinke at kuchinke@illinois.edu or via phone at 217-333-0807.

If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at 217-333-2670 or via email at irb@illinois.edu.

Case Study Informed Consent

I have read and understand the above information and voluntarily agree to participate in the research project described above. I am 18 years of age or older, and I have been given a copy of this consent form.

Signature Date

I do agree to have the interview audio taped for the purposes of transcription.

Signature Date

I do agree to be photographed for the purposes of documentation of incidents that occur during the study (training, meetings).

Signature Date

You **MAY/ MAY NOT** (please circle one) identify me by name and/or rank in the final document.

THANK YOU for considering to be a part of this important study.

If you have any questions about your rights as a participant in this study or any concerns or complaints, please contact the University of Illinois Institutional Review Board at 217-333-2670 or via email at irb@illinois.edu.

Appendix D: Interview Guide

1. How long have you been a firefighter?

2. How long with this department?

3. What is your current position?

4. What is your pedigree that brought you to this rank?

5. Do you have family members that are in the fire service? How did they influence you?

6. What drew you to the fire service?

7. What is it like to be a member here?

8. What are three exceptional aspects of the DQFD?

9. What is something that you would change if you were Chief?

10. Please describe what the department was like prior to 2010. What was training like? Going on responses? Around the station?

11. What is the department like now? Training, responses, around the station?

12. How has the way you respond to a fire changed?

13. What else is different now?

Appendix E: Document Review Guide

Title of Document: (Form is condensed for Appendix)	Date of review:
Scope/Intent of document:	Physical attributes of document: # Pages, readability, format:
Location of document: Public, Private, Posted, Archived	Content of Document:
Member awareness of document:	Member knowledge/familiarity of document:
Document connected to: □ Modes of Implementation □ Instrumental Strategy □ Expressive Strategy □ Primary Strategy □ Assumptions □ Basic Values	How is the document utilized in the FD?
Notes:	Other:

Appendix F: Observation Guide

Date:	Location:
Persons Present: (Form is condensed for Appendix)	Description of location:
Milieu: (Décor, colors, artifacts, posted documents, what is on the walls, floors, ceiling; furniture, lighting):	Interactions between persons & location:
Modes of Implementation: Observable Behaviors of members. Static Artifacts. Physical aspects of the environment.	Instrumental Strategies: Rationale behind outward-focused (public) behaviors and artifacts.
Expressive Strategies: Rationale behind inward-focused (non-public) behaviors and artifacts.	Assumptions & Basic Values: Member thoughts and beliefs about organizational strategies and modes of implementation.
Notes:	Other:

Appendix G: Coding Schema

Typical Day at the Department - General Comments
Member Requirements & onboarding - Career O Qualifications - Career FF Qualifications - POC O Qualifications - POC FF Qualifications - POC Participation - Initial Training (Career & Volunteer)
Responses - Accountability System - Fire Responses - Volunteer Responses - Medical Responses
External - Compartment Standardization - Interagency Partnerships - Interagency Training - Automatic Aid - Mutual Aid - ISO
Officer Empowerment - Preplanning - Inspections - Investigations - Fire Prevention/ Public Education - Equipment - NFIRS Reporting - Apparatus
Training - Driver Training/Familiarization - Company/Shift Training - Departmental Training - Interagency Training